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PINE

RUN

WATERSHED

ENVIRONMENTAL

IMPACT STATEMENT

PENNSYLVANIA

MONTGOMERY COUNTY
PENNSYLVANIA
MAY 1975



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
HARRISBURG, PENNSYLVANIA

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Pine Run Watershed Project
Montgomery County, Pennsylvania

FINAL ENVIRONMENTAL IMPACT STATEMENT

Benny Martin, State Conservationist
Soil Conservation Service

Sponsoring Local Organizations

Montgomery County Conservation District
Courthouse, Norristown, Pennsylvania 19400

Montgomery County Commissioners
Courthouse, Norristown, Pennsylvania 19400

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USDA ENVIRONMENTAL IMPACT STATEMENT

Pine Run Watershed Project

Montgomery County

Pennsylvania

Prepared in accordance with
Sec. 102(2) (C) of P. L. 91-190

II. SUMMARY SHEET

- I. Final
- II. Soil Conservation Service
- III. Administrative
- IV. Brief description of project purpose and action. A project for watershed protection and flood prevention in Montgomery County, Pennsylvania, to be implemented under authority of the Watershed Protection and Flood Prevention Act (PL-566, 83rd Congress, 68 Stat. 666), as amended. Project proposals consist of conservation land treatment, two floodwater retarding structures and a program of nonstructural measures.
- V. Summary of Environmental Impacts including favorable and adverse environmental effects.

Reduce flood damages in the watershed by 98 percent.

Reduce soil erosion by 96 percent.

Reduce sediment concentrations in Pine and Sandy Runs by 13 percent. Structural measures and land treatment will reduce flow velocities in Pine, Rapp and Sandy Runs.

Vegetation established on the structural works of improvement will provide permanent habitat for wildlife.

Two dams will cover 400 feet of stream.

Permanent pool at PA-634 will cover 1,900 feet of Rapp Run.
Permanent pool at PA-635 will cover 2,400 feet of Pine Run.

The dams, spillways and permanent pools commit 35 acres of land. Approximately 54 acres of land and 5,400 feet of stream will be inundated by the 100-year flood.

Approximately five acres of woodland and nine acres of openland will be temporarily disturbed by borrow pits.

Construction equipment will cause temporary noise and dust pollution.

VI. List of alternatives considered:

Land Treatment Measures Only

Land Treatment Supplemented with Nonstructural Measures

Structural Measures Only

No Project

VII. Comments have been received from the following agencies and organizations.

U. S. Department of the Army

U. S. Department of the Interior

U. S. Department of Transportation

Environmental Protection Agency

State Conservation Commission of the Pennsylvania Department of Environmental Resources (Governor's Designated Agency for Reviews and Approval of PL-566 Projects.)

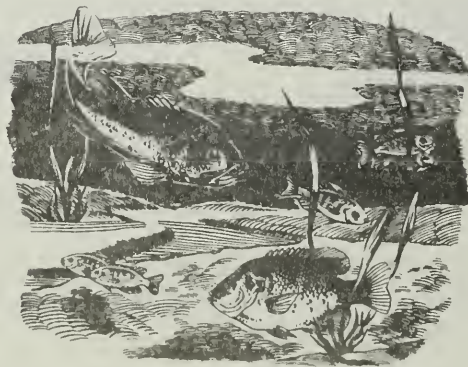
Governor's Budget Office (State Clearinghouse)

Montgomery County Planning Commission

Pennsylvania Turnpike Commission

Trout Unlimited

VIII. Draft Statement submitted to Council on Environmental Quality on February 14, 1975.



III. PROJECT IDENTIFICATION AND ENVIRONMENTAL SETTING

USDA SOIL CONSERVATION SERVICE FINAL ENVIRONMENTAL IMPACT STATEMENT FOR PINE RUN WATERSHED, PENNSYLVANIA

AUTHORITY

Installation of this Project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83rd Congress, 68 Stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Montgomery County Commissioners
Montgomery County Conservation District

PROJECT PURPOSES

Watershed Protection (Conservation Land Treatment)

The Sponsors' goal is to control erosion in this highly urbanizing area with debris basins, diversions, subsurface drains, and critical area treatment. The Sponsors also have the goal of seeing that an acceptable level of treatment will be achieved and the Pennsylvania Clean Streams Law will be complied with. The reduction in erosion rates to acceptable levels on this highly eroding area were of prime consideration in setting this goal.

The goal of the land treatment program is to reduce soil erosion from 65 tons/acre/year to 10 tons/acre/year during development.

Flood Prevention

The following are the flood prevention goals of the sponsors:

1. Reduce flood stages along Pine Run in Fort Washington Industrial Park for the 100-year frequency flood.
2. Reduce flood stages along Sandy Run in Fort Washington Industrial Park (downstream from the project area).
3. Reduce the flood plain area inundated by a 100-year frequency flood from 145 acres before project installation to 50 acres after. These areas are located along Pine and Rapp Runs.
4. Eliminate direct flood damage (\$1,530,000) along Pine Run for the 100-year frequency flood.

WORKS OF IMPROVEMENT TO BE INSTALLED

Land Treatment Measures

A land treatment program was developed by the Soil Conservation Service, the Forest Service with the assistance of Bureau of Forestry, Pennsylvania Department of Environmental Resources, and the Montgomery County Conservation District. This program is strengthened by the requirements for sediment control of the Pennsylvania Clean Streams Law, as amended which requires that all earthmoving activities within the Commonwealth shall be conducted in such a way as to prevent accelerated erosion and the resulting sedimentation.

Technical assistance will be provided by the Soil Conservation Service and Bureau of Forestry, Pennsylvania Department of Environmental Resources in cooperation with the Forest Service. This assistance will be available to the Montgomery County Commissioners, Montgomery County Conservation District, local communities and individual landowners.

Land treatment measures to be installed are recommended on the basis of data from the completed Montgomery County Soil Survey Report (April 1967), field observations and land use.^{1/} Measures to be installed on 1,500 acres of urban, built-up and other areas, include diversions, debris basins, forest land measures, temporary vegetation, recreation area plantings, subsurface drains, grassed waterways or outlets, wildlife upland habitat management and heavy use area protection. Installation of land treatment measures will be by the landowners on their holdings. Developers will install erosion and sediment control practices during construction to minimize erosion and surface water runoff. They will be encouraged to utilize the natural landscape in their planning. Prior to issuance of work permits, township officials will review and approve development plans to ensure compliance with ordinances and will work with developers to ensure inclusion of appropriate protection.

The Montgomery County Conservation District has developed an erosion and sediment control handbook for urbanizing areas.

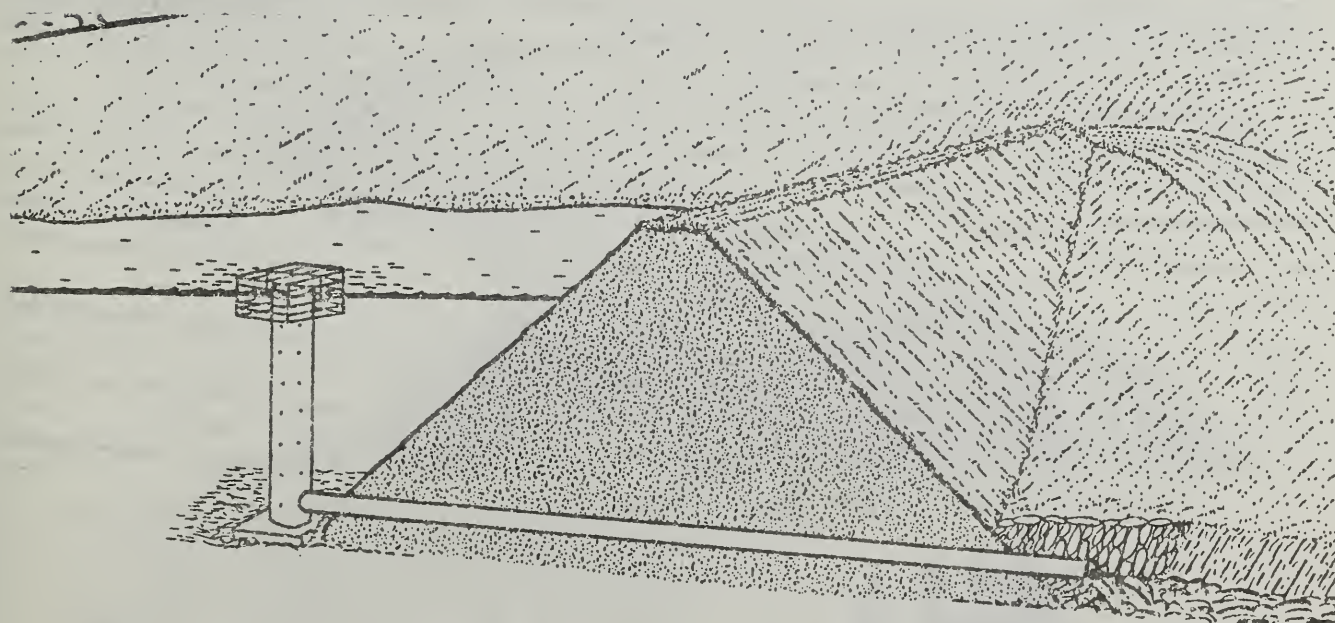
Technical assistance can be provided to developers and landowners for onsite plans to minimize erosion and for the installation of those measures specifically needed to promote and maintain vigorous vegetative cover. Developers and landowners will also be encouraged to utilize the natural landscape in their planning and management.

^{1/} All information and data, except as otherwise noted by reference to source, were collected during watershed planning investigation by the Soil Conservation Service, and the Forest Service of the United States Department of Agriculture.

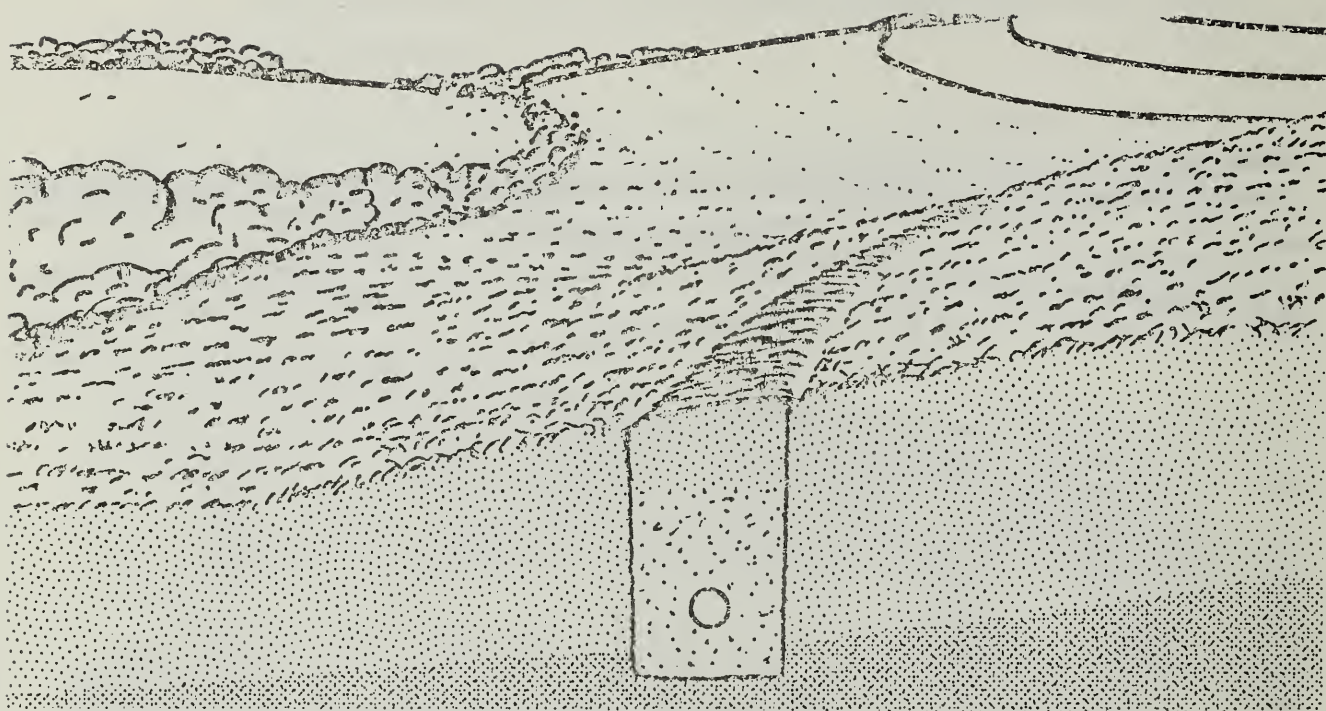
Definitions and Illustrations of practices to be installed:



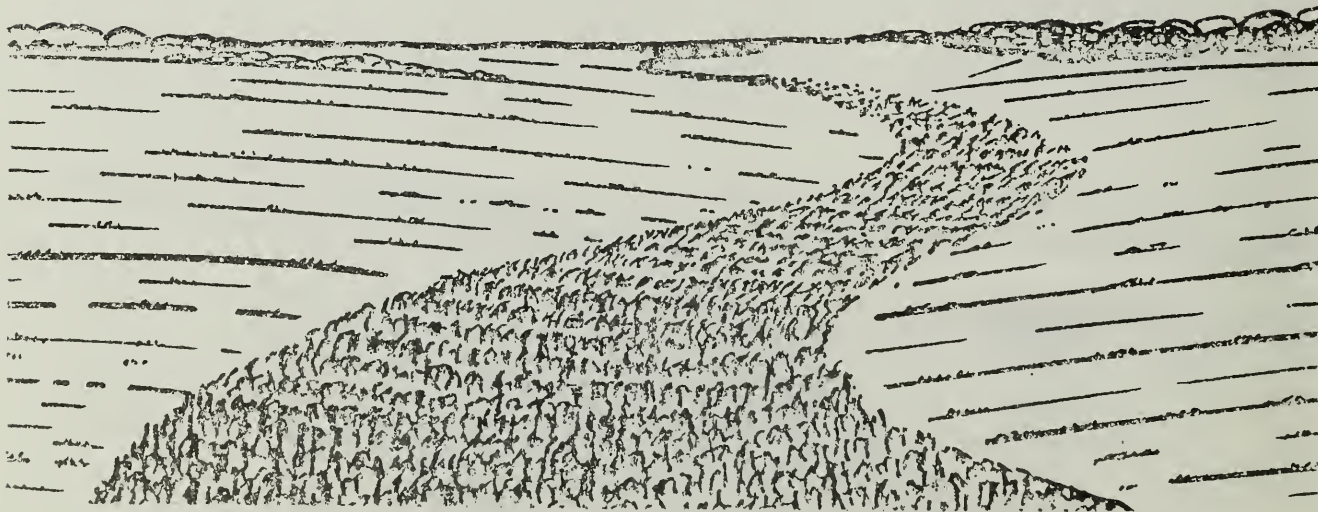
Diversion: A channel with a supporting ridge on the lower side constructed across the slope.



Debris Basin: A barrier or dam constructed across a waterway or at other suitable locations to form a silt or sediment basin.



Subsurface Drain: A conduit such as tile, pipe, or tubing, installed beneath the ground surface which collects and/or conveys drainage water.



Grassed Waterway or Outlet: A natural or constructed waterway or outlet shaped or graded and established in suitable vegetation as needed for the safe disposal of runoff from a field, diversion or other structure.

Recreation Area Improvement: Establishing grasses, legumes, vines, shrubs, trees, or other plants or selectively reducing stand density and trimming woody plants to improve an area for recreation.

Wildlife Upland Habitat Management: Retaining, creating, or managing wildlife habitat other than wetland.

Heavy Use Area Protection: Protecting heavily used areas by establishing vegetative cover, by surfacing with suitable materials, or by installing needed structures.

Nonstructural Measures

Rapid urbanization in the watershed has caused many problems. In order to preserve some open space for recreation, aesthetic quality, and wildlife purposes, to comply with the amended Clean Streams Law, and keep flood damages from increasing, there is a need to control land use development so that it occurs in an orderly, planned and desirable manner.

Land use regulations already in force in the watershed include zoning areas to residential, commercial and industrial uses. As part of the township's flood insurance program the flood plain will be delineated and use regulations will be enacted. The implementation of the flood insurance program will also fulfill the requirements of PL-93-234, the "Flood Disaster Protection Act of 1973."

The nonstructural measures for this plan include: the implementation and enforcement of ordinances, within enforcement authority of each sponsor, and that the sponsor exert strong leadership in seeing that continual updating of land use ordinances takes into account the capabilities of the land, and the latest environmental, social and economic needs of the community.



Structural Measures

Two single purpose floodwater retarding structures (PA-634 and PA-635) are planned for installation. PA-634 is located on Rapp Run about 1,600 feet upstream from Highland Avenue. PA-635 is located on Pine Run about 600 feet upstream from Route 152 at Dresher.

PA-634 will be an earth fill embankment structure with a 130 foot wide earth emergency spillway. The principal spillway will be a 30 inch reinforced concrete pipe with a 2 1/2' x 7 1/2' riser and an impact basin outlet. The principal spillway system will rest on a nonyielding rock foundation.

PA-634 will control 1.8 square miles of drainage or about 29 percent of the watershed. Reservoir storage will be 72 acre feet for sediment accumulation and 370 acre feet for temporary floodwater storage. Sediment and flood storage volumes are set to assure that the emergency spillway will have less than a one percent chance of use.

PA-634 will affect 95 acres and involve the following land uses and stream channel lengths:

<u>Purpose</u>	<u>Forest land</u> (acres)	<u>Open land</u> (acres)	<u>Total</u> (acres)	<u>Stream</u> (lineal ft.)
Embankment and Emergency Spillway	8	3	11	200
Sediment Pool	4	5	9	1,900
Temporary Flood Pool (100-yr.)	17	14	31	2,500
Top of Dam	11	18	29	1,000
Subtotal	40	40	80	5,600
Temporary Con- struction Area	<u>8</u>	<u>7</u>	<u>15</u>	<u>-</u>
TOTAL	48	47	95	5,600

Borrow areas totaling about eight acres will be located entirely within the designated landrights area of the reservoir.

Modification to Susquehanna Road will be required by riprapping that portion of the road embankment subject to temporary backwater during flooding. This is a part of the local landrights cost. A vacant stone building, owned by the township, located near the centerline of the dam will be allowed to remain but will be subject to periodic flooding.

Structure site PA-634 will be constructed with a nine-acre sediment pool 8.5' deep in which sediment will accumulate over its 100-year design life. The reservoir site and surrounding land will be maintained as an open space and possibly incorporated into a local park.

PA-635 will be an earth fill embankment structure utilizing a dual concrete and earth emergency spillway system. The first stage emergency spillway will be a 240 foot wide reinforced concrete drop structure. The second emergency spillway will be a 100 foot wide excavated earth emergency spillway with a crest elevation the same as the reinforced concrete drop structure. The principal spillway will be a three by three foot monolithic conduit outletting into the basin of the drop structure. The inlet of the conduit will be a standard covered riser.

The site will be constructed with a nine-acre sediment pool in which sediment will accumulate over its 100-year design life. The reservoir site and surrounding land will be maintained as an open space and possibly incorporated into a local park.

PA-635 will control 1.9 square miles of drainage or about 31 percent of the watershed. Reservoir storage will be 42 acre feet of sediment storage and 308 acre feet of temporary floodwater storage. Sediment and flood storage volumes are calculated to assure that the emergency spillway will have less than a one percent chance of use.

PA-635 will affect 79 acres and involve the following land use and stream channel lengths:

<u>Purpose</u>	<u>Forest land</u> (Acres)	<u>Open land</u> (Acres)	<u>Total</u> (Acres)	<u>Stream</u> (Lineal ft.)
Embankment and Emergency Spillway	1	5	6	200
Sediment Pool	3	6	9	2,400
Temporary Flood Pool (100-yr.)	7	16	23	2,900
Top of Dam	5	27	32	1,100
Subtotal	16	54	70	6,600
Temporary Con- struction Area	<u>1</u>	<u>8</u>	<u>9</u>	<u>-</u>
TOTAL	17	62	79	6,600

Borrow area totaling about six acres will be needed in addition to the emergency spillway excavation. The borrow area will be located entirely within the landrights acquisition area and as much as possible will be removed from below the emergency spillway crest to increase flood-water storage.

Borrow area outside of the sediment pool area but within the temporary flood pool will disturb nine acres of existing crop and pasturelands and five acres of forest land. It will be necessary to remove all existing vegetation and topsoil in order to obtain fill material for the embankment. Vegetation removal will be accomplished similarly to that in the embankment area. Likewise, erosion and sediment control practices will be used during project installation.

Before construction, vegetation will be removed. Trees of marketable size will be harvested. Smaller trees, branches and brush will be chopped and disposed of in approved sanitary landfill locations. Topsoil and surface organic matter will be collected and stock piled. Topsoil piles will be smoothed and planted with grasses and legumes.

The section of the Pennsylvania Turnpike embankment which will be affected by floodwater stored in PA-635 will be riprapped as required. This is a landrights cost to be borne by the local sponsors.

Installation of PA-634 and PA-635 will not cause the relocation of people, farms or business operations.

The foundation for these structures is stable bedrock consisting of red shales, siltstones and gray sandstones of lower Stockton, Triassic. This bedrock is near the soil surface over most of the structure centerline.

Borrow material for the embankment is adequate and in sufficient quantities adjacent to the sites. The borrow has been classified as sandy silt (ML) and silty sand (SM). The foundation has no critical earthquake hazards. The characteristics of the borrow material have been considered in the design of the embankment to minimize earthquake hazards to the structures.

The foundation in structure PA-634 consists of two to seven feet of sandy silt (ML) on the abutments and alluvial deposits of sandy silts (ML), silty sand (SM), organic silts (OL) and sand and gravel to a depth of 7.0 feet in the flood plain. The foundation in structure PA-635 consists of one to three feet of sandy silt (ML) over highly weathered bedrock (SM) in the abutments. In the flood plain 1.5 feet of organic silt (OL) overlies alluvial sandy silts (ML) to a depth of 5.5 feet where highly weathered bedrock (SM) was encountered.

The structure design considers the earthquake hazards related to the critical foundation materials and will provide proper embankment slopes, cutoff trench through weathered bedrock and proper drainage measures to alleviate possible seepage.

The preliminary earthquake investigation included location of the project area on the Seismic Risk Map from Algermissen's 1969 Seismic Risk Map of U.S., a review of earthquake records in "Earthquake History of United States," Part I, ESSA, 1965; a study of regional geology maps for evidence of major active faulting or areas of crustal movement, and a study of the geology at proposed structure sites to identify critical materials of geologic conditions that pose as earthquake hazards.

During construction, these actions will be used to control erosion and pollution.

1. Conduits or bridges will be installed where construction activities require crossing of flowing streams. This practice will eliminate sediment production at the crossing sites.
2. Sprinkling, along with other methods, will be used to keep dust within tolerable limits.
3. Sanitary facilities will be installed according to the requirements of the Pennsylvania Department of Environmental Resources.
4. Measures will be provided at equipment storage and repair areas to prevent contaminants from reaching streams and ground water.
5. The following erosion and sediment control measures will be applied to the areas of land which will be exposed.
 - a. Diversions, waterways and terraces will be used to retard the rate of runoff and control runoff from the construction site.
 - b. Sediment basins will be used to trap sediment resulting from construction and dewatering operations.
 - c. Clearing and grubbing of construction site and borrow areas will be done in stages as construction progresses, in order to keep sediment production to a minimum.
 - d. Temporary vegetation and/or mulching will be used to protect the soils. Segments of work will be completed and protected as rapidly as is consistent with construction schedules.
6. All operations will be conducted to minimize turbidity in the stream at and below the structures. Requirements established by the Pennsylvania Department of Environmental Resources will be conformed to during construction.

After construction has been completed, the borrow area will be graded to slopes that blend with adjacent areas and then reseeded with adapted grasses, legumes and woody vegetation to provide erosion protection and wildlife food and cover. The embankment, emergency spillway and construction area will be seeded for protection from erosion and for wildlife habitat.

The method for vector control (mosquitoes) will be mutually agreed upon by the Soil Conservation Service, local sponsors, and the Pennsylvania Department of Environmental Resources. If the shallow portions of the permanent pools become an insect breeding area they can be deepened.

A detailed archeological and historic study of project sites has been performed by a professional archeologist. The study revealed no archeological or historical artifacts of significant enough values to alter construction plans.

Should archeological artifacts be uncovered during construction, the National Park Service and the Pennsylvania Historical and Museum Commission will be notified. Construction activities in the affected areas will not continue until arrangements satisfactory to the sponsors and the affected agencies and the Service have been made.

The sediment pools at the two structures have a potential for incidental recreational use. Even though the reservoirs will be on publicly owned land the sponsors will prohibit recreational use of these areas until such time as they provide adequate access and sanitary facilities.

Operation and Maintenance

Montgomery County Conservation District will be responsible for providing assistance to landowners and operators for continued operation and maintenance of erosion and sediment control measures. The land user will perform the needed maintenance to safely convey water without causing excessive erosion. Some items that will need attention may include, but not be limited to, reseed areas, cut, mow and spray; apply fertilizer periodically and replace damaged or washed out measures as needed.

Montgomery County Commissioners will be responsible for operation and maintenance of both PA-634 and PA-635 structures. Operation of the structures will be carried out so that the flood prevention purpose is insured.

Maintenance of the reservoirs will include some of the following items: remove debris from embankment and reservoir area, restore eroded or damaged structural elements, regularly inspect the structures, restore protective vegetation cover, inspect embankment drainage system and repair as needed, provide wave protection, replace eroded areas in emergency spillway or around principal spillway discharge points, and provide recommended maintenance of the vegetative cover including delaying mowing so as not to be disruptive to nesting animals and birds. Other operation and maintenance items needed are contained in the State Operation and Maintenance Handbook which has been furnished to the sponsors.

The cost of operating and maintaining the structure measures are estimated to average \$2,100 annually. Montgomery County Commissioners will finance these expenses through annual appropriations.

These annual operation and maintenance costs represent the value of materials, equipment, services and facilities needed to operate the project and make repairs and replacements necessary to maintain structural measures in sound operating condition during the evaluated life of the project. They include the cost of repairs, replacements, or additions and an appropriate charge for inspection, engineering, supervision, custodial services and general overhead.

Joint inspections by both the Soil Conservation Service and the sponsoring local organization personnel will be held during the establishment period which extends three years after the structural measure has been completed. Joint inspections will be held annually and after severe floods or other unusual conditions that might adversely affect the structural measure. The sponsors will continue the inspections after the third year. An annual report is to be prepared by the sponsors on the results of operation and maintenance inspections. This report is to be sent to the Soil Conservation Service.

Operation of the structural measures will be in compliance with state and local laws, health regulations and criteria established by the Pennsylvania Department of Environmental Resources.

Specific operation and maintenance agreement will be executed prior to signing a landrights or project agreement. The agreement will include specific provisions for retention and disposal of property acquired or improved with PL-566 financial assistance.

Project Costs

Installation Cost Item	<u>PL-566</u>	<u>Other</u>	<u>Total</u>
Land Treatment	\$ 20,000	\$ 69,000	\$ 89,000
Structural Measures	<u>882,000</u>	<u>1,211,000</u>	<u>2,097,000</u>
Total Project	\$902,000	\$1,284,000	\$2,186,000

The construction cost of \$745,000 will be paid entirely by PL-566 funds.



ENVIRONMENTAL SETTING

Physical Data

Pine Run is a tributary of Sandy Run which is a tributary of the Wissahickon Creek. The watershed drainage area is 3,940 acres.

The watershed is located in the metropolitan Philadelphia area of southeastern Pennsylvania. The city limit of Philadelphia is four miles south of the project. The project is located in central eastern Montgomery County and lies entirely within the county. The population of Pine Run Watershed is 10,000.

Pine Run is located in the Mid-Atlantic Water Resource Region as designated by the Water Resource Council and in the Delaware River Sub-Region (02-04). Problems of the project area are typical of those in suburban metropolitan areas. Social and economic pressures have caused 85 percent of the project area to be developed for urban purposes. Excessive erosion rates occur where land is being developed. Urban development continues to encroach on flood plain areas and thus are continuously increasing the flooding problems.

The soils in the northern and central portions of the watershed are formed from Triassic shale and sandstone or windblown silts. The slopes are nearly level to gently sloping.

The soils formed from shale and sandstone are Lansdale, Penn, Readington and Abbottstown. These are loamy deep soils except for the moderately deep Penn. Lansdale and Penn are well drained; Readington is moderately well-drained; and Abbottstown is somewhat poorly drained.

The northern and central portions of the watershed area are underlain by shale and sandstone but many of the soils are formed in deposits of windblown silts. These are silty, deep soils of the Lawrenceville, Chalfont and Doylestown series. Lawrenceville is moderately well-drained. Chalfont is somewhat poorly drained and Doylestown is poorly drained.

The soils adjacent to the streams are deep, poorly drained Bowmansville and deep, moderately well-drained Rowland. Bowmansville and Rowland soils are subject to flooding.

The major soils in the southernmost portion of the watershed are formed from quartzite, gneiss and schist. The slopes are dominantly gently sloping to sloping. The soils are the deep Edgemont and the moderately deep Glenelg. The soils are loamy and well-drained.

The soils along the streams include the moderately well-drained Codorus and the poorly drained Hatboro. These soils are deep and subject to flooding.

Erosion is a dominant problem on 2,084 acres (53% of the area) and wetness is a problem on 1,234 acres (31% of the area). Most of the

area is developed or being developed regardless of the type of soil problems encountered.

The Montgomery County soil survey has been completed and was published in April 1967.

The northern portion of the Pine Run Watershed is located in the Triassic Lowland physiographic province. In this area, the bedrock consists of shales, siltstones and sandstones in the lower member of the Stockton formation, Triassic in age. Rolling hills overlain by shallow residual soils are typical of the area.

The southern portion of the watershed, located immediately south of the Pennsylvania Turnpike, lies in the Piedmont Uplands physiographic province. In this area, the steepening of the topography is characterized by rocks of the Chickies formation composed of quartzites and quartz schist, lower Cambrian in age. Also, Pre-Cambrian schist and granite gneiss are present.

A northeast-southwest trending diabase dike crosses the watershed and cuts through the Triassic and Cambrian rocks.

Elevations range from 380 feet above mean sea level at the top of the ridges to about 160 feet where Pine Run empties into Sandy Run.

Climate is mostly continental with some marine influence. Temperatures average 56° F. with extreme ranges from 14° F. below zero to 105° F. Average annual precipitation is 44 inches.

No significant mineral resources are known to be present in the watershed. Stone was mined from quarries near the watershed. Mica was formerly mined near Philadelphia. Siliceous limestone is quarried from the Elbrook formation (Cambrian-Ordovician). North of the watershed, a small amount of sand and gravel is being mined from the Stockton formation.

In the fractured and jointed rocks of the Stockton formation, water wells have yielded up to 300 gallons per minute. Near the watershed, good supplies of water are being pumped from the solution cavities of the Cambrian limestones and dolomites. In most places, small amounts of water can be developed from wells in the Chickies quartzite. Some wells located in Lower Merion Township have been developed in the micaceous rocks of the Wissahickon formation.

Records from "Earthquake History of United States, Part I" indicate that this area was shaken at least eight times during the past 300 years, by major earthquakes having epicenters to the north in Seismic Risk Zone 3, the St. Lawrence Valley Region.^{1/} Pine Run Watershed is located 265 miles southwest of Risk Zone 3.

^{1/} "Earthquake History of United States, Part I"; R. A. Eppley; U. S. Department of Commerce, ESSA; U. S. Printing Office; 1965.

Major earthquakes are those that correspond to the 1931 Modified Mercalli damage intensity scale of VIII or higher. This intensity is equivalent to the Richter scale (1935) of 5.8 plus. The most recent of these occurred at Attica, New York, in 1929 and at Massena, New York, in 1944.^{1/} The damage ratings are based on damage to existing rigid structures.

Earthquakes in the Northeastern United States have not been frequent or intense according to B. F. Howell.^{2/} Pine Run Watershed is within Howell's "Regions of Transient Hazard" which is characterized by moving earthquake centers of unequal frequency and intensity. Adequate data is not available to establish any patterns or cycles. The last known tremor occurred in Philadelphia (Risk Zone 1) in February 1973, rated as 3.5 on the Richter scale.^{3/} No injuries or damages were reported.

Current land use is shown in the following table.

<u>LAND USE</u>	<u>ACRES</u>	<u>PERCENT</u>
Cropland	350	9
Grassland	120	3
Forest land	200	5
Urban and built-up	3,270	83
Residential	1,480	
Industrial & Commercial	850	
Idle	680	
Roads	260	
TOTAL	3,940	100

Hardwood forest stands that predominate the area consist largely of white oak, red oak, ash, maple, elm and yellow poplar types.

Small acreages of crop and pasture are being custom farmed.

Urban encroachment is continually increasing at the expense of agricultural and forest lands. At present, there are 206 acres of land being used for recreation or open space. This acreage is included with forest land (parks) and urban and built-up land (golf courses, etc.).

^{1/} "Earthquake History of United States, Part I"; R. A. Eppléy; U. S. Department of Commerce, ESSA; U. S. Printing Office; 1965.

^{2/} Technical Paper: "Earthquake Hazard in Eastern United States"; B. F. Howell.

^{3/} Risk Zone 1: "Seismic Risk Map of the United States"; S. T. Algermissen; U. S. Coast and Geodetic Survey; 1969.

Urban development is continuing at the rate of about 100 acres per year.

Pine Run begins near the boundary of Upper Dublin and Upper Moreland Townships near Willow Grove. The stream flows for 3.5 miles in a west southwest direction parallel to the Pennsylvania Turnpike throughout its course.

Pine Run, upstream from its crossing under Dreshertown Road, is an unmodified, natural stream which is intermittent in flow characteristics. From this crossing downstream to Susquehanna Road, it is an unmodified perennial flowing stream. Downstream from Susquehanna Road, the stream was modified during installation of Fort Washington Industrial Park.

Rapp Run, a tributary of Pine Run, originates in Jarrettown. It flows for two miles in a southwesterly direction until it joins Pine Run. Above Route 152, the stream is a natural well defined channel with intermittent flow characteristics. From Route 152 to Highland Avenue, Rapp Run is in a natural channel and flows perennially. The stream bottom has a heavy silt deposit with a number of exposed large rocks. Below Highland Avenue, Rapp Run was modified when the industrial park was developed.

Pine Run drains into Sandy Run which empties into the Wissahickon Creek about one mile downstream. Wissahickon Creek flows through Fairmount Park in Philadelphia to its junction with the Schuylkill River. The Schuylkill River joins the Delaware River in South Philadelphia.

There are 12 ponds from one to five acres in size but no natural lakes. There are no wetlands as described in "Wetlands of the United States."^{1/}

The following data on "Protected Water Use" was developed by the Pennsylvania Department of Environmental Resources and indicates general water use and quality criteria. Even though individual use and quality criteria may not reflect present conditions or be applicable to Pine Run now, they do serve as a goal to be obtained.

^{1/} "Wetlands of the United States"; United States Department of the Interior; Fish and Wildlife Service; Circular 39; 1971.



Protected Water Use

Aquatic Life

Warm water fishes. Maintenance and propagation of fish food organisms and all families of fishes except Salmonidae.
Trout (stocking only). Warm water fishes and trout stocking.

Water Supply

Domestic water supply. Used by humans after conventional treatment for drinking, culinary and other purposes.
Industrial water supply. Used by industry for inclusion into products, processing and cooling.
Livestock water supply. Used by livestock and poultry for drinking and cleansing.
Wildlife water supply. Used for waterfowl habitat and by wildlife for drinking and cleansing.
Irrigation. Used to supplement precipitation for growing crops.

Recreation

Fishing. Use of the water for the legal taking of fish.
Water contact sports. Use of the water for swimming and related activities.
Natural area. Use of the water as an aesthetic setting to recreational pursuits.

Other

Power. Use of the water energy to generate power.
Treated Waste Assimilation. Use of the water for the assimilation and transportation of treated waste water.

Pennsylvania Minimum Water Quality Criteria 1/

pH

Not less than 6.0 and not more than 8.5.

Dissolved Oxygen

For the period 2/15 to 7/31 of any year, no value less than 5.0 mg/l. For the remainder of the year, no value less than 4.0 mg/l. For lakes, ponds and impoundments only, no value less than 4.0 mg/l in the epilimnion.

Iron

Total iron not more than 1.5 mg/l.

Temperature

Not more than a 5° F. rise above ambient temperature or a maximum of 87° F., whichever is less; not to be changed by more than 2° F. during any one-hour period.

1/ See Water Quality Table for PA-634 and PA-635 for comparison with state criteria (page 24).

Dissolved Solids

Not more than 500 mg/l as a monthly average value; not more than 750 mg/l at any time.

Bacteria (Coliforms/100 ml)

For the period 5/15 to 9/15 of any year, not more than 1,000/100 ml as an arithmetic average value; not more than 1,000/100 ml in more than two consecutive samples; not more than 2,400/100 ml in more than one sample.

For the period 9/16 to 5/14 of any year, not more than 5,000/100 ml as a monthly average value, nor more than this number in more than 20% of the samples collected during the month, nor more than 20,000/100 ml in more than 5% of the samples.

Phosphate

Not more than 0.40 mg/l or natural levels, whichever is greater.

Copper

Not more than 0.10 mg/l.

The quality of the water in Rapp Run at PA-634 appears satisfactory from the standpoint of supporting fish life and noncontact water based recreation. The water temperature at midmorning on August 25, 1969 was 64° F., pH was 7.7; methylorange alkalinity was 51 ppm; dissolved oxygen was 9 ppm. Mayflies and minnows were present. The stream bottom has a heavy silt deposit with a number of exposed large stones. The area surrounding the proposed pool is gently sloping, nicely wooded with large trees, mainly ash, maple and tulip poplar.

At PA-635 a large part of the site is being cropped and thus producing a heavy silt load. The remainder of the pool area is wooded. The watershed above the site is rapidly becoming urbanized. Although there are no known sewage treatment plants affecting the site, it seems safe to assume that the site is receiving pollution from septic tanks. The temperature of the water at midmorning on August 25, 1969, was 65° F., pH was 7.7; methylorange alkalinity was 68 ppm; dissolved oxygen was 7 ppm. Mayflies and caddis flies were present in the stream along with minnows. These factors indicate that the water quality is suitable for supporting a fair warm water fishery although none exists at the present time.

The water quantity and quality at sites PA-634 and PA-635 was tested once by Ambler Laboratories during the month of October 1973.^{1/} The results of this sampling are shown in the following table:

^{1/} Note: This one sample was obtained to develop an indication of water quality.

Water Quality Table

	<u>PA-634 Rapp Run</u> <u>10/5/73-11 A.M.</u>	<u>PA-635 Pine Run</u> <u>10/15/73-1 P.M.</u>
pH -----	7.2	7.3
Conductivity -----	280 Micro mohs	370 Micro mohs
Total Acidity -----	10 mg/l	10 mg/l
Dissolved Oxygen -----	8.2 mg/l (80% Sat.)	7.0 mg/l (68% Sat.)
Iron -----	0.05 mg/l	0.15 mg/l
Water Temperature -----	58° F.	58° F.
Air Temperature 1/		
Maximum -----	82° F.	76° F.
Minimum -----	51° F.	50° F.
Dissolved Solids -----	220 mg/l	166 mg/l
Bacteria:		
Total Coliform -----	1600/100 ml	1600/100 ml
Fecal Coliform -----	1480/100 ml	1520/100 ml
Turbidity (JTU) -----	2	8
Threshold Odor Number ---	odorless	odorless
Alkalinity -----	84 mg/l	108 mg/l
MBAS -----	0.5 mg/l	0.5 mg/l
Total Manganese -----	less than 0.01 ppm	less than 0.01 ppm
Fluoride -----	0.25 mg/l	0.75 mg/l
Cyanide -----	none	none
Sulfate -----	20 mg/l	18 mg/l
Chloride -----	16 mg/l	30 mg/l
Phosphate -----	1.2 mg/l	7.0 mg/l
Phenol -----	none	none
Color (Filter Sample) ---	0	0
Copper -----	0.05 mg/l	none
Zinc -----	less than 0.5 mg/l	less than 0.5 mg/l
Stream Flow (cfs) -----	1.2	1.6
Suspended Solids -----	3 mg/l	20 mg/l
Nitrate Nitrogen -----	0.3 mg/l	0.04 mg/l
Carbon Dioxide -----	none	none
Hardness -----	108 mg/l	114 mg/l

1/ Climatological data - U. S. Department of Commerce National Oceanic and Atmospheric Administration Environmental Data Science Station, Phoenixville.



Economic Data

Forty-four acres of public land (Mundock and Lair Parks) in the watershed are owned by Upper Dublin Township. The remaining acreage is privately owned except for roads and other transportation facilities.

Mundock Park (24 acres) is located along Rapp Run in the vicinity of the proposed location for PA-634. Lair Park (20 acres) is located two miles northeast of Pennsylvania Turnpike Interchange #26.

There are about five farms remaining in the watershed. These average around 160 acres in size and are primarily dairy or horticulture enterprises.

Agricultural land is being converted to urban use at a rate of about 100 acres per year. If this rate continues, nearly all land will be in urban or park uses by 1985.

The Fort Washington Industrial Park comprises a tract of approximately 600 acres zoned for light industrial warehousing, offices and research and development facilities.

Land values vary from \$2,500 to \$5,000 per acre for housing and up to \$50,000 per acre for commercial use.

Present watershed population is approximately 10,000. The population is projected to be 12,500 by 1980 and 17,500 by 2000.

The labor force is considered to be fully employed (unemployment below 4 1/2%). Source of income for most of the residents is from the industries located in the watershed. The available work force numbers about 6,000. Four of the larger companies in the industrial park employ 75% of this number.

The level of income is above the state average and is reflected in per capita income average. In 1968, per capita income in Upper Dublin Township was \$4,430, which is 30% above the state average.

The Watershed is located within the jurisdiction of the Delaware River Basin Commission.

Fish and Wildlife Resources

Fish and wildlife resources within the watershed are limited. Pine Run and Rapp Run are inhabited with minnows; no game fish were sighted. There are small populations of gray squirrels, cottontail rabbits, ringnecked pheasants, bobwhite quail and white tail deer; but the outlook for their existence is not good. The small amount of existing habitat is dwindling as the process of urban development continues.

The following list of birds and mammals have been either recently observed or known to be living in the vicinity of the proposed impoundments. There are no threatened or endangered species of fish or wildlife in the watershed. The influence of pollution and other water factors on the fish and wildlife resources is negligible.

Wildlife Species Recently Observed or Residing in
the Vicinity of the Proposed Impoundments

Whitetail Deer
Cottontailed Rabbit
Gray Squirrel
Red Fox
Norway Rat
Muskrat
Field Mouse
Raccoon
Skunk
Opossum
Chipmunk
Great Blue Heron
Green Heron
Canada Goose
Mallard
Black Duck
Common Merganser
Turkey Vulture
Sharp-shinned Hawk
Red-tailed Hawk
Red-shouldered Hawk
Broad-winged Hawk
Marsh Hawk
Sparrow Hawk
Bobwhite
Ring-necked Pheasant
Killdeer
American Woodcock
Solitary Sandpiper
Mourning Dove
Yellow-billed Cuckoo
Black-billed Cuckoo
Screech Owl
Whip-poor-will
Common Nighthawk
Chimney Swift
Ruby-Throated Hummingbird
Belted Kingfisher
Yellow-shafted Flicker
Red-bellied Woodpecker
Red-headed Woodpecker
Yellow-bellied Sapsucker
Hairy Woodpecker
Downy Woodpecker
Brown-headed Cowbird
Scarlet Tanager
Cardinal
Rose-breasted Grosbeak
Evening Grosbeak
Purple Finch

Eastern Kingbird
Crested Flycatcher
Eastern Phoebe
Empidonax (sp)
Eastern Wood Pewee
Barn Swallow
Purple Martin
Blue Jay
Common Crow
Black-capped Chickadee
Tufted Titmouse
White-breasted Nuthatch
Red-breasted Nuthatch
House Wren
Carolina Wren
Catbird
Robin
Hermit Thrush
Gray-cheeked Thrush
Eastern Bluebird
Ruby-crowned Kinglet
Cedar Waxwing
White-eyed Vireo
Red-eyed Vireo
Prothonotary Warbler
Blue-winged Warbler
Yellow Warbler
Black-Throated Blue Warbler
Black-Throated Green Warbler
Chestnut-sided Warbler
Blackpoll Warbler
Prairie Warbler
Ovenbird
Louisiana Waterthrush
Mourning Warbler
Hooded Warbler
Wilson's Warbler
Canada Warbler
American Redstart
House Sparrow
Red-winged Blackbird
Baltimore Oriole
Rusty Blackbird
Common Grackle
Myrtle Warbler
Bay-breasted Warbler
Blackburnian Warbler
Pine Warbler
House Finch
Brown Creeper

Wildlife Species Recently Observed or Residing in
the Vicinity of the Proposed Impoundments (continued)

Winter Wren	Kentucky Warbler
Mockingbird	Yellowthroat
Brown Thrasher	Snow Bunting
Wood Thrush	Common Redpoll
Swainson's Thrush	Pine Siskin
Veery	American Goldfinch
Golden-crowned Kinglet	Rufous-sided Towhee
Water Pipit	Savannah Sparrow
Starling	Vesper Sparrow
Yellow-throated Vireo	Slate-colored Junco
Black-and-White Warbler	Tree Sparrow
Worm-eating Warbler	Chipping Sparrow
Parula Warbler	Field Sparrow
Magnolia Warbler	White-throated Sparrow
Palm Warbler	Fox Sparrow
Northern Waterthrush	Swamp Sparrow
	Song Sparrow

Plant Resources

The plant communities in Pine Run Watershed are quite variable. They range from small areas of old fields in early stages of succession, to mature stands of hardwoods that are about 50 years of age. Species include a mixture of native and naturalized plants as well as crop and horticultural varieties established in the area by present and former landowners.

Vegetation differs with land use. For example, old fields formerly cultivated for agricultural use are in early stages of succession and are sparingly to heavily covered with weedy, herbaceous species. Fields in disuse for longer periods have been invaded by woody species. Vegetation of golf courses in the watershed consist mainly of turf-grasses suitable for greens and fairways, shade trees and border plants of herbs, shrubs and trees.

A partial listing of plants found growing in typical areas within the watershed is as follows:

1. Idle crop and pasture fields

These areas are those no longer in use for agriculture and are reverting to woodland. Vegetation in the vicinity of Site PA-635 along Dreshertown Road consists of weeds, herbs, shrubs and small trees with a few large willows. Typical species include:

cattail	nightshade, bittersweet
dogwood, panicked	rose, multiflora
fescue, meadow	quackgrass
garlic, meadow	segues (Carex spp.)
goldenrod	sweetclover
milkweed, common	willow, black

2. Industrial Parks

Industrial areas developed in the watershed within the past 10 years support moderate amounts of open turf areas with some large native trees remaining. A typical industrial park area is along Pinetown Road between the Pennsylvania Turnpike and Delaware Drive.

Both planted and invading species are found along the stream channel. In addition to large trees left during development, trees, shrubs and turf species were planted for shade, screens, hedges, borders and landscaping purposes. A partial list of the planted and volunteer species found in the area include:

Trees

alder, European 1/
aspen (Populus spp.)
hemlock 1/
honeylocust, thornless (street) 1/
locust, black
maple
oak, pin (street) 1/
pine, white (screen) 1/
spruce
willow, black

Herbaceous plants

bluegrass, Kentucky 1/
clover, red
clover, white
crabgrass (Digitaria spp.)
crownvetch 1/
daisy fleabane
dandelion
fescue, tall 1/
foxtailgrass (Setaria spp.)
horsetail (Equisetum spp.)
knotweed (Polygonum spp.)
plantain (Plantago spp.)
sweet clover

Shrubs and vines

barberry 1/
indigobush
Juniper 1/
rose, multiflora
rhododendron 1/
yew 1/



3. Transportation Corridors

Highway and railroad rights-of-way support a wide variety of plants. Vegetation varies with width of the right-of-way, steepness of cut and fill slopes, kind of soil, drainage and intensity of vegetative management. Plants generally consist of perennial and annual or biennial reseeding grasses, legumes, weeds and vines with borders of shrubs and trees. Typical areas observed include the Pennsylvania Turnpike Interchange Number 26, Susquehanna Road, Dreshertown Road and Twining Road. A partial list of plants include:

1/ Planted species

Mowed Areas

bluegrass, Kentucky 1/	fescue, meadow
clover, white	fescue, tall
crabgrass	foxtailgrass (Setaria spp.)
dandelion	plantain

Herbaceous plants of non-mowed slopes

beggar-ticks (Bidens spp.)	lespedeza, sericea 1/
bromegrass, smooth	lettuce, prickly
cheat (Bromus spp.)	milkweed, common
chickory	nightshade, bittersweet
clover, red	orchardgrass
crownvetch 1/	poison-ivy
daisy fleabane	quackgrass
day-lily	ragweed (Ambrosia spp.)
dock, curly	redtop grass
dogbane (apocynum spp.)	sweetclover
garlic, meadow	tall-redtop (Triodia spp.)
goldenrod (Solidago spp.)	thistle (circuim spp.)
honeysuckle, Japanese	yarrow

Plants of drainageways and ditches

canarygrass, reed	maple
cattail	Phragmites
elderberry	sedge (Carex spp.)
indigobush	willow (Salix spp.)

Woody trees, shrubs and vines of fencerows and borders

blackberry	poison-ivy
cherry, black	rose, multiflora
grape, wild	sassafras
honeysuckle, Japanese	sumac (Rhus spp.)
honeysuckle, tatarian	walnut
locust, black	

4. Open land in residential developments

Some areas within the watershed were previously cleared and used for agricluture. Typical of residential development in open land is the area along Dillon Road near the watershed divide. Vegetation consists largely of planted species including turf grasses and ground cover plants, cultivated flowers, vegetables and small fruits. Shrubs and trees have been planted for shade, borders, screens, hedges and general landscaping purposes. Most trees are from 10 to 20 feet in height. A partial listing of species include:

1/ Planted species

Shade and landscape trees and shrubs

arborvital (screen) <u>1/</u>	locust, black
azalea <u>1/</u>	maple, Norway <u>1/</u>
birch, white <u>1/</u>	mountain-ash <u>1/</u>
dogwood, flowering <u>1/</u>	oak, pin <u>1/</u>
cherry, black	pine, scotch (screen) <u>1/</u>
cherry, flowering <u>1/</u>	spruce, blue
holly, Japanese <u>1/</u>	spruce, Norway (screen)
Juniper <u>1/</u>	yew

Ground covers

pachysandra 1/
turf grasses-bluegrass fescue 1/

5. Woodland in residential developments

Areas of woodland, such as found along Twining Road, south of the turnpike and railroad, have been developed for residences. This area is a natural stand of pole-size to mature (about 50 years old) hardwood trees with some natural understory trees and shrubs. Additional utility and landscaping plants have been added. A partial list of plants typical of this area includes:

Trees

ash	maple, sugar
beech	oak, red
elm	oak, white
hickory	sycamore
maple, red	yellow-poplar

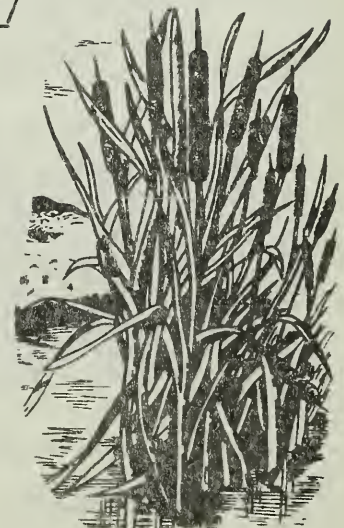
Shrubs

arrowwood	forsythia <u>1/</u>
cedar, Eastern red	hemlock (hedge) <u>1/</u>
dogwood, flowering	maple, Japanese <u>1/</u>
dogwood, panicked	sassafras

Vines and ground cover plants

grape, wild
honeysuckle, Japanese
ivy, English 1/
pachysandra 1/

1/ Planted species



Herbaceous species

carpetweed (mollugo spp.)	Mayapple
day-lily (Hemerocallis spp.)	orchardgrass
deertongue grass (Panicum spp.)	pokeweed (Phytolacea spp.)
garlic, meadow	ragweed (Ambrosia)
goldenrod	thistle, Canada
joepyeweed (Eupatorium spp.)	

6. Parks of mixed hardwoods and open grasslands

A typical example is Upper Dublin Township Park (Mundock Park), along Camp Hill Road and near Site PA-634. Vegetation consists of mixed stands of young to mature trees along with native, naturalized and planted trees; shrubs and herbaceous plants. Some areas are maintained in an open grassland condition by periodic mowing. A partial list of species observed include:

Trees

maple, silver	sassafras
maple, red	walnut
hickory	

Woods, border and understory shrubs

arrowwood	honeysuckle, tatarian
barberry	privet (Ligustrum spp.)
blackberry	rose, multiflora
blackhaw	rose, wild
crabapple	spicebush
dogwood, flowering	sumac
dogwood, panicle	winterberry (Ilex spp.)

Vines

grape, wild	poison-ivy
honeysuckle, Japanese	Virginia creeper

Grasses

bluegrass, Kentucky
deertongue grass
fescue, meadow
orchardgrass
quackgrass
sweet vernalgrass

Legumes

bean, wild (Phaesolus spp.)
black medic
clover, red
clover, white
sweetclover

Herbaceous and other ground cover plants

aster spp.	heal-all (<i>Prunella vulgaris</i>)
beggar-ticks (<i>Bidens</i> spp.)	hawkweed (<i>Hieracium</i> spp.)
burdock (<i>Arctium</i> spp.)	joepyeweed
blue-eyed-grass (<i>Sisyrinchium</i> spp.)	lettuce, prickly (<i>Lactuca</i> spp.)
butter-and-eggs	milkweed, common
black-eyed-susan	nightshade, bittersweet
cinquefoil, common	peppergrass (<i>Lepidium</i> spp.)
chickweed (<i>Stellaria</i> spp.)	plantain
carrot, wild	pokeweed
dandelion	ragweed, common
dock (<i>Rumex</i> spp.)	ragweed, great
dewberry (<i>Rubus</i> spp.)	smartweed (<i>Polygonum</i> spp.)
dogbane (<i>Apocynum</i> spp.)	sorrel, common
daisy, fleabane	strawberry, wild
daisy, ox-eye	thistle (<i>Cirsium</i> spp.)
deftford, pink	violet (<i>Viola</i> spp.)
fern (unidentified)	wood-sorrel (<i>Oxalis</i> spp.)
garlic, meadow	yarrow
goldenrod	

Additional trees and shrubs noted in the watershed outside typical areas described include:

apple	pine, Virginia
elm, Chinese	mimosa
firethorn	sweetgum
pine, Austria	willow, weeping

The following groups of plants found in the watershed are considered to be the most utilized by wildlife in the Northeast. They are listed in descending order of utilization. 1/

Woody plants

oak	hickory
blackberry	alder
wild cherry	poison-ivy
pine	elm
dogwood	cedar
grape	willow
maple	hemlock
beech	ash
birch	elderberry
sumac	Virginia creeper
aspen	tuliptree
spruce	mountain-ash
	holly

1/ Martin, Zim and Nelson, American Wildlife and Plants, McGraw-Hill, 1951, pp 476-478.

Upland weeds and herbs

bristlegrass (Setaria spp.)
sedge
crabgrass
panicgrass
clover
sheepsorrel (Rumex spp.)
bluegrass
pokeweed
dandelion
plantain
ragweed

Marole and aquatic plants

smartweed

Cultivated plants

apple
cherry (cult.)

Archeological and Historical Values and Unique Scenic Areas

No sites listed in the National Register of Historic Places (as of February 1975) are located within the watershed. Investigations have revealed a manor house along Pinetown Road which appears to meet the criteria for eligibility for inclusion in the Register. This house is in the watershed but unaffected by either PA-634 or PA-635.

A field reconnaissance of damsites PA-634 and PA-635 by a professional archeologist indicated no archeological or historical artifacts of significant enough value to alter construction plans. 1/

There are two houses and about 150 acres of land which have local historical value located in the vicinity of the proposed flood prevention structure on Rapp Run.

In 1682 this area was part of an original 5,000 acre land grant from William Penn to his friend and physician Dr. Thomas Wynne. This area is located in Upper Dublin Township, Montgomery County, bordered by Pinetown Road, Susquehanna Road, Camp Hill Road and Highland Avenue and bisected by Rapp Run. Sometime between 1682 and 1692, Dr. Wynne built a hunting lodge - four rooms of local stone and oak beams - still standing on Pinetown Road about a quarter of a mile from Susquehanna Road.

The other house of historical interest is at the intersection of Susquehanna and Camp Hill Roads. Part of this house was an old log cabin probably constructed in the mid-18th century.

A branch of the Lenai-Lenape Indian tribe, which lived in the watershed, had a burial ground where Camp Hill Road and Susquehanna Road intersect.

1/ A copy of the "Archaeological Field Reconnaissance of Damsites PA-635 and PA-634" is on file at the Soil Conservation Service State Office at Harrisburg, Pennsylvania.

Recreational Resources

Pine Run Watershed lies within State Planning Region No. 1 which is comprised of Bucks, Chester, Delaware, Montgomery and Philadelphia Counties. 1/ The region contains more than 26,000 acres of state-owned game, fish and parklands. This amounts to only eight acres per 1,000 people, and is far below the state standard of 25 acres per 1,000 people. Based on population estimates for 1980, there is a current deficit of about 85,000 acres of state parkland in Region No. 1. 2/

Local recreation land in Region No. 1 is also seriously deficient. Records indicate that there are approximately 18,000 acres of local, municipal and county parklands in the region. This amounts to about five acres per 1,000 persons and is far below the state standard of 15 acres per 1,000 people. There is a current deficit of about 36,000 acres of local parkland in Region No. 1.

The number of visitors to state parks in Region No. 1 increased 50% - from 3.2 million in 1953 to 4.9 million in 1964. During 1964, Pennsylvania's total of 175,000 acres of state parks served twenty-five million visitors, an average of 146 visitors per acre. In Region No. 1 there were 1,025 visitors per acre. This was more than three times the intensity of park use experienced by any other state planning region.

Bucks County currently maintains nine county parks covering about 3,000 acres and plans to acquire seven new parks. Delaware County has approximately 300 acres of parkland distributed among ten small parks and plans to develop four new parks covering 670 acres. Montgomery County operates and maintains seven county parks covering 1,200 acres. Two of these parks are on Perkiomen Creek, and plans are being made to acquire 180 acres of flood plain along Wissahickon Creek which will be maintained in a natural state for pedestrian access between portions of Fort Washington State Park. Chester County manages two parks totaling 1,250 acres. Philadelphia manages 2,600 acres in addition to Fairmount Park which contains 7,900 acres and plans to acquire fifty-four acres for ten new city parks.

The watershed also lies within State Park Planning Area No. 1, which is comprised of Philadelphia, Delaware, Chester, Berks, Montgomery, Bucks, Lehigh and Northampton Counties. 3/ This eight county planning area had an increase in population from 3.3 million in 1940 to 4.6 million in 1968 for a growth of 39.4 percent in 28 years. During the same period, the population of the state as a whole increased by only 18.7 percent. This section has more people per square mile than any

1/ Statewide Outdoor Recreation Plan, an interim report, Pennsylvania State Planning Board, 1965.

2/ Regional Development Reconnaissance Report, Region No. 1, Pennsylvania State Planning Board, 1966.

3/ Outdoor Recreation Horizons, Pennsylvania Department of Environmental Resources, 1970.

of the other state park planning areas. On the basis of total population and population density, this area should contain the largest acreage of state parklands. Unfortunately, the reverse is true. This area contains the least acres per 1,000 population. The Philadelphia State Park Planning Area 1/, by virtue of its large urban population and limited open space, is an outdoor recreation outflow area. The lure of less crowded and scenically attractive destination-type recreation areas is causing a migration to surrounding planning areas.

A total demand for 13,640,000 activity days of picnicking is estimated for State Park Planning Area No. 1 by 1980. The Pennsylvania Department of Environmental Resources has assumed the responsibility for meeting 33% of the demand but the remainder must be met by county and local parks.

The demand for camping by 1980 will be approximately 1,710,000 activity days, of which the Pennsylvania Department of Environmental Resources will provide 50% of the needs. Demands for swimming, boating and fishing are estimated to be 39,000,000, 5,600,000 and 2,412,000 activity days, respectively. The state will provide for 12, 5 and 5 percent of these demands, respectively.

Presently, the public recreation facilities in Pine Run Watershed are inadequate. The available facilities are in the following listing.

<u>Name</u>	<u>Type</u>	<u>Acres</u>
Gwyn Valley Sportsman Club	Sportsman Club	3
Pinetown Golf Course	Golf	55
Burn Brae Golf Course	Golf	97
Mundock Park	Picnicking	24
Lair Park and Woods	Ballfield and open space	20
		<u>199</u>

The influence of pollution in the water quality of existing recreational resources in the watershed is negligible.

The area is changing rapidly from agriculture to urban uses. This is occurring before ordinances have been adopted to insure adequate open space and protection from building on undeveloped flood plains.

Forty-four acres of public land (Mundock and Lair Parks) in the watershed are used by Upper Dublin Township. The remaining acreage is privately owned except for roads and other transportation facilities.

Mundock Park (twenty-four acres) is located along Rapp Run in the vicinity of the proposed location for PA-634. Lair Park (20 acres) is located two miles northeast of Pennsylvania Turnpike Interchange No. 26.

1/ Also known as State Park Planning Area No. 1.

Soil, Water and Plant Management Status

During the last two decades, land use has shifted from an agricultural-ly dominated landscape to an urbanized environment. The following table summarizes the land use changes which have taken place.

<u>Land Use</u>	<u>Percent 1958</u>	<u>Percent 1972</u>
Cropland	41	9
Grassland	9	3
Forest land	16	5
Urban and built-up	34	83

Because of the urbanizing nature of the area, there is only one conservation district cooperator in the watershed. He has established some conservation practices on his land. Assistance to land users and developers for urban erosion control has been limited to technical advice and review of development plans. This assistance is expected to continue in the future.

Recent regulations adopted to administer the Pennsylvania Clean Streams Law will have a direct bearing on the future management of soil and water resources. These regulations will require an erosion and sedimentation control plan be developed and implemented for all earth moving activities. In addition, a Pennsylvania Department of Environmental Resources permit is required for all earthmoving activities exposing 25 or more acres at one time. This acreage requirement may be lowered at any time by the Department of Environmental Resources or at the request of local officials.

Montgomery County Conservation District will review erosion and sedimentation control plans and provide technical assistance in the preparation and implementation of the plans.

An average erosion rate for developed areas in the watershed stabilized with established vegetation is about 2.5 tons per acre per year. ^{1/} For land being developed, the average erosion rate is about 65 tons per acre per year, but in extreme cases the erosion rate may exceed 100 tons per acre per year.

^{1/} Erosion rates are based on studies made in the drainage areas of the proposed reservoirs. Studies of land in the urban and miscellaneous category at the time of the assessment ranged from 0.4 to 7.2 tons per acre per year and had a weighted average of 2.5 tons per acre per year.



WATER AND RELATED LAND RESOURCE PROBLEMS

Land and Water Management

There is a need for development regulations to preserve vegetation and "green space" within urban and industrial development. Large paved and roofed areas cause an increase in runoff rates. This increase may be as much as 80 percent. Vegetated areas reduce runoff, provide open space for residents and furnish favorable cover for animals and birds.

Erosion rates on land as it is being developed will be reduced from the 65 tons per acre per year now experienced to 10 tons per acre with the installation of the recommended sediment and erosion control measures. (This is a net reduction of 55 tons per acre per year which will be experienced during the period the land is undergoing development.) Following the conversion of land to urban uses, erosion rates are expected to decrease to 2.5 ^{1/} tons per acre. Extreme erosion rates could occur on 670 acres subject to development. Erosion rates on the remaining lands are expected to remain undamaged.

About 2,500 feet of manmade channel on Pine Run and Rapp Run have sections of eroding streambanks that are contributing sediment to the stream. These banks need to be vegetated or otherwise protected from erosion. These segments of unstabilized channel yield about 210 tons of sediment per year at the mouth of Pine Run.

Soil Conservation Service studies indicate that on about 53% of the area, erosion or the potential for erosion because of the lack of vegetative cover is the dominate limitation. This limitation can be overcome with the proper planning. The other major land resource problem is wetness which occurs on 31% of the area.

Floodwater Damage

There are nine commercial and industrial properties in Pine Run Watershed subject to flooding. These properties are located in the Fort Washington Industrial Park. Immediately downstream from Pine Run on the Sandy Run flood plain are 16 industrial and commercial properties subject to flooding.

All of this development has taken place since 1960 and, as a result, there is only a brief history of flooding. Rainstorms occurring in 1955, 1965, 1967, 1969, 1972 and 1973 caused flood damage. The Sheraton Motor Inn is subject to annual flooding. The greatest flood likely to occur on an average of once in 100 years (100-year frequency) would cause damages estimated at \$1,530,000 in Pine Run Watershed

^{1/} Erosion rates are based on studies made in the drainage areas of the proposed reservoirs. Studies of land in the urban and miscellaneous category at the time of the assessment ranged from 0.4 to 7.2 tons per acre per year and had a weighted average of 2.5 tons per acre per year.

and an additional \$1,440,000 damages downstream.

Indirect and secondary effects of the direct flood damage, through loss of business, loss to dependent buyers, loss of incentive payments, goodwill and reputation, are estimated to be \$500,000.

Average annual damages which include both direct and indirect effects to commercial establishments are \$455,000.

Erosion Damage

Severe sheet erosion occurs in some areas of the Pine Run Watershed. Annual rates of sheet erosion are as high as 10 tons per acre on cultivated land. Excessive sheet erosion rates, averaging about 65 tons per acre per year, occur on land undergoing urban development. In steep areas annual rates may exceed 100 tons per acre during their development period. When construction is completed and streets, utilities, lawns and other landscape features are in place, the rate of sheet erosion reduces to an average of 2.5 tons per acre. During times of excessive erosion, the sedimentation of channels and flood plains may also occur.

Urbanization is increasing the amount of impervious roads, parking lots and roofs and is reducing the amount of vegetated areas. Increased runoff may cause streambank erosion and channel enlargement.

About 2,500 feet of manmade channel on Pine Run and Rapp Run have sections of eroding streambanks contributing sediment to the stream. These banks need to be vegetated or otherwise protected from erosion. Most of the rest of the channels in the watershed are stable. Streambank erosion was evaluated as a sediment source in the design for sediment storage in the proposed reservoirs.

Sediment Damage

The annual sediment yield from the watershed is estimated to exceed 2.5 tons per acre. Sediment damage to agriculture land in the watershed is small because only nine percent of the land is under cultivation and these areas are in the upland.

Most sediment damage occurs to commercial and industrial land and is evaluated with floodwater damage.

The segments of unstabilized channel annually yield about 210 tons of sediment to the mouth of Pine Run.

Plant and Animal Resource Problems

Animal populations within the watershed are suppressed because of a lack of appropriate cover and land management. The existence of many forms of wildlife, particularly game species, are in a precarious position due to the elimination of habitat as a result of urban development. Eighty-five percent of the watershed is already urban

and the remaining land is being rapidly developed. This trend toward urbanization is apparently irreversible and independent of the proposed watershed project. There is no indication that future priorities will change the current trend in land use in the project area.

There are a mere 350 acres of cropland and 200 acres of forest land in the watershed. Six hundred and eighty acres are idle and awaiting development. Urban encroachment is continually increasing at the expense of these lands which are now providing habitat for wildlife.

Generally, populations of upland game birds and mammals are curtailed by the scarcity of cropland and the lack of hedgerows and field borders. The lack of water impoundments along with the lack of nesting and feeding habitat are responsible for the absences of waterfowl, marsh and shore birds. Flash floods are detrimental to wildlife during the nesting and broodrearing periods.

Flooding, bank erosion and sedimentation are adversely affecting the fishery resources in the watershed and in the Wissahickon Creek. These factors, together with intermittent and low flows, prevent the establishment of game fish in Pine and Rapp Runs. There is a need for fishing waters in the watershed and the surrounding area. Studies show that by 1980 there will be a demand for 2.4 million activity days of fishing within this area. 1/

Water Quality Problems

Water quality data indicates that both Rapp Run and Pine Run are slightly polluted. This was indicated by the coliform bacteria count which is an indicator of the presence of pollution. Pollution from fertilizers and pesticides is not indicated in the data.

The available data indicates that the water quality of both Pine Run and Rapp Run is such that only non-contact activities should be allowed. As work progresses in switching more and more homeowners from septic tanks to city sewers the quality of the pond water will undoubtedly improve.

Municipal and Industrial Water Supply

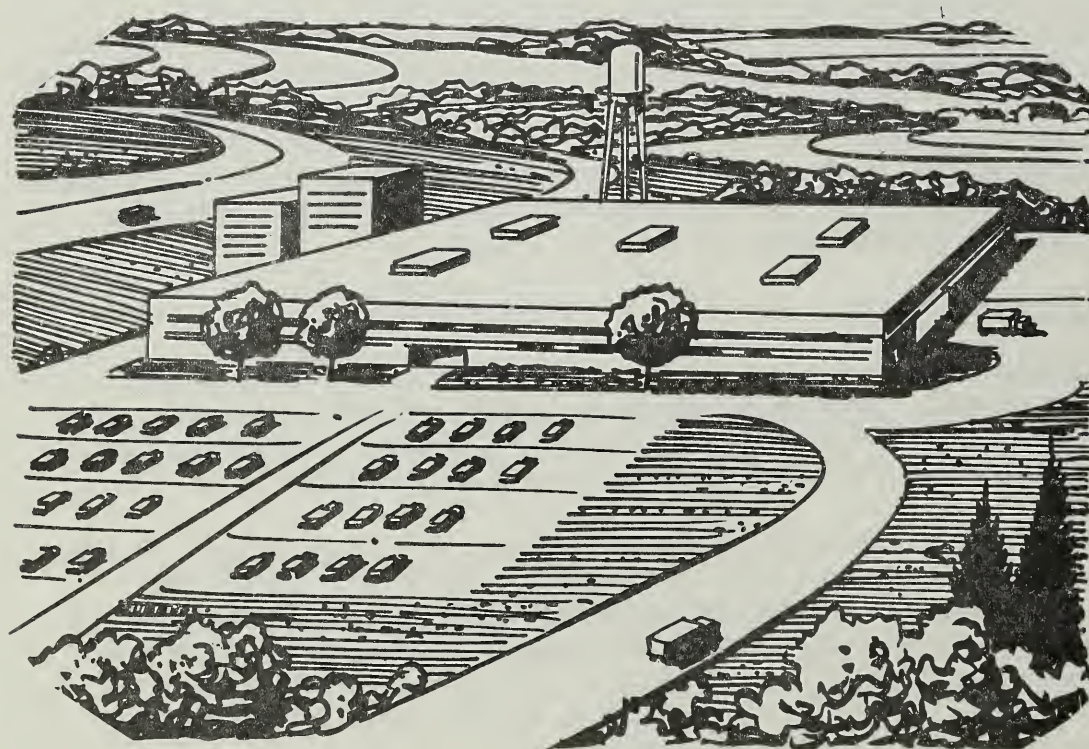
The availability of water for the residential, commercial and industrial communities within the watershed is adequate.

The watershed is supplied with water by the Philadelphia Suburban Water Company, and the Dublin Water Supply Company. Both companies indicated that their water supply was adequate for the present and immediate future.

1/ Outdoor Recreation Horizons, Pennsylvania Department of Environmental Resources, 1970.

Economic-Social Problems

The area is changing rapidly from agriculture to urban uses. This is occurring before ordinances have been adopted to insure adequate open space and protection from building on undeveloped flood plains.



IV. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

This proposed program is consistent with the Upper Dublin Comprehensive Plan of 1966, and the official map for Upper Dublin Township adopted in December 1971. The comprehensive plan for the township calls for the stream corridors for both Rapp and Pine Run to be kept as open space. The township is also endeavoring to control the development of the flood plain and reduce the damage and monetary loss from flooding. This is being accomplished through the National Flood Insurance program which is one of the nonstructural proposals of this project.



V. ENVIRONMENTAL IMPACT

Land Treatment Measures

Erosion rates on land being developed will be reduced from the 65 tons per acre per year now experienced to 10 tons per acre with the installation of the recommended sediment and erosion control measures. (This is a net reduction of 55 tons per acre per year.) Following the completion of development of urban uses, erosion rates are expected to decrease to 2.5 tons per acre. Extreme erosion rates could occur on 670 acres planned for development. Erosion rates on the remaining lands are expected to remain undamaged.

Existing sediment concentration in Pine Run at the junction of Sandy Run is 780 part per million (ppm). With the project installed, the average sediment concentration is expected to change to 680 ppm. The two floodwater retarding structures are expected to accumulate 114 acre feet of sediment over the 100 year evaluation period. Annually, the sediment load of Pine Run will be reduced by 1,250 tons.

Land treatment measures planned for the watershed will reduce the detrimental effects of urbanization on wildlife resources. While opportunities to enhance wildlife resources in connection with the project may be limited due to the proximity to commercial and residential developments, the overall effect of maintaining any vegetation in an urban area may be considered beneficial.

Nonstructural Measures

About 100 acres of land scattered throughout the project area are affected by the proposed flood plain use ordinances. These lands will be maintained for low intensive use such as parking lots, wildlife habitat, and open space.

Land use regulations will provide adequate space for trees, brush, shrubs and other favorable habitat suitable for mammals and birds. Also, the intermingling of vegetative plant communities with manmade urban structures will provide an aesthetic contrast.

Structural Measures

Flood stages along Pine Run in Fort Washington Industrial Park, will be reduced an average of 3.5 feet for the 100-year frequency flood. The average out-of-bank flood depth before project installation is 7.0 feet and after installation will be 3.5 feet.

Flood stages along Sandy Run in Fort Washington Industrial Park, but downstream from the project area, will be reduced by 3.2 feet. The 100-year flood out-of-bank depths (low bank) are expected to be 9.2 feet before and 6.0 feet after project installation.

The proposed structural measures will have an insignificant effect on flooding along the main stem of Wissahickon Creek.

The peak discharge of Pine Run at its confluence with Sandy Run for the 100-year frequency flood is expected to be 2,300 cubic feet per second (c.f.s.) after project installation. This is a reduction of 2,050 c.f.s. from the without project peak discharge of 4,350 c.f.s.

The flood plain area inundated by a 100-year frequency flood will be reduced from 145 acres before project installation to 50 acres after. These areas are located along Pine and Rapp Runs. An additional 50 acres along Sandy Run, downstream from the project, will be protected.

Direct flood damage (\$1,530,000) along Pine Run will be essentially eliminated for the 100-year frequency flood. The present condition average annual damages of \$56,000 were considered as eliminated after the project is installed. Seven industrial and commercial properties will be protected from flood damages up to the 100-year frequency flood. Storms of greater magnitude could cause some damage, but were not evaluated. Two additional properties will be subject to occasional nuisance flooding of the lawn and low areas. Floodwaters are not expected to get into the buildings during a 100-year frequency flood.

Downstream along Sandy Run, flood damages will be reduced from \$1,440,000 for the 100-year frequency flood under present conditions to \$657,000 after project installation. Two commercial and industrial properties will be protected from future flooding and 13 properties will have reduced flood damage but would be subject to infrequent floods with potential damage to buildings and contents.

Average annual flood damages will be reduced 98 percent in the project area and 57 percent along Sandy Run downstream from the project.

Existing land that will be utilized in installing the floodwater retarding structures is summarized in the following table:

<u>Purpose</u>	<u>Forest land</u> (Acres)	<u>Open land</u> (Acres)	<u>Total</u> (Acres)	<u>Stream</u> (Lineal feet)
Embankment and Emergency Spillway	9	8	17	400
Sediment Pool	7	11	18	4,300
Temporary Flood Pool (100 yr.)	24	30	54	5,400
Top of Dam	16	45	61	2,100
Subtotal	<u>56</u>	<u>94</u>	<u>150</u>	<u>12,200</u>
Temporary Construction Area	<u>9</u>	<u>15</u>	<u>24</u>	<u>-</u>
TOTAL	65	109	174	12,200

Borrow area outside of the sediment pool area but within the temporary flood pool will disturb nine acres of existing open land and five acres of forest land. After construction has been completed, the borrow area will be graded to slopes complimentary to adjacent areas and reseeded with adapted grasses, legumes and woody vegetation to provide erosion protection and wildlife food and cover.

The sediment pools at PA-634 and PA-635 will destroy existing habitat on seven acres of forest land, 11 acres of open land and 4,300 feet of natural stream. In its place, two nine-acre pools suitable for warm water fish will be created. These impoundments will increase the variety of bird life inhabiting the area by attracting waterfowl, marsh and shore birds.

Temporary flood pools will periodically inundate 24 acres of forest land, 30 acres of crop and pasture lands and 5,400 feet of natural flowing stream. Existing habitat will not be disturbed except when floodwaters will be temporarily stored. Generally, when occasional floodwaters are stored, wildlife will be able to find other nearby habitat to their liking.

Quantity and quality of water are not expected to change significantly when the project is installed. Site PA-634 and PA-635 will store water in nine acre sediment pools and may increase stream temperature. PA-634 will not affect the low flows in Rapp Run. PA-635 will not affect the low flows in Pine Run.

Threatened and endangered species do not inhabit the project area.

Sites listed in the National Register of Historic Places or sites potentially eligible for listing will not be affected by the proposed works of improvement.

A stone building at PA-634 can be moved to a location outside of the reservoir pool area. The first flood elevation of the building is three to four feet above the sediment pool. If not moved, periodic flooding can be expected, but damage will be limited to minor silta-tion. The land can be utilized as a local park. The value of the land will be maintained and unharmed by project installation.

The construction and operation of floodwater retarding structures with reservoir site land clearing will accelerate the loss of upland wildlife habitat already taking place. However, the overall trend of urban development is irreversible and independent of the proposed watershed development. The 150 acres committed to dams, spillways, and temporary pools will not be subject to urban development.



A 1963 reconnaissance report by the U. S. Bureau of Sport Fisheries and Wildlife indicated that fish and wildlife resources will not be adversely affected to a significant degree by project construction. ^{1/} The project is expected to benefit fisheries through reduction of flood stages, stabilization of streambank erosion, and reduced stream siltation.

Economic and Social

The direct primary beneficiaries are the industries and commercial establishments which will be protected from floodwater damage. The elimination of flood damage repair costs will reduce the overall cost of production of service allowing the company to remain competitive.

Among the indirect primary beneficiaries, employees are the big gainers. Their job security is dependent upon the strength and competitiveness of the employer. By improving the employer's competitive business position, a real impact is felt by the individual worker in the form of job security and welfare, which is transferred to his family.

Aside from the flood prevention benefits, the quality of living will also be enhanced by the commitment of land and the creation of a water impoundment for open space use and aesthetics.

The open space use by watershed residents will alleviate the use of preserves or neighboring regional open space and recreation areas.

The commitment of 150 acres at the two sites will be more efficient use of the land in that it will serve more than one purpose - flood prevention and open space. As a result of the program, public owned land in the watershed will increase from 44 acres to 194 acres.

Favorable Environmental Effects

- a. The flood damages for a 100-year frequency flood along Pine Run will be reduced by 98 percent.
- b. The area along Pine Run, flooded by a 100-year storm, will be reduced from 145 acres to 50 acres.
- c. An additional 50 acres will be protected along Sandy Run.
- d. The erosion rates on land being developed will be reduced from 65 tons per acre per year to 10 tons per acre per year during development.

^{1/} Conservation and Development Report on the Wissahickon Creek Watershed Project, Montgomery County, Pennsylvania; United States Department of the Interior; Fish and Wildlife Service (Bureau of Sport Fisheries and Wildlife); October 8, 1963.

- e. The sediment concentrations will be reduced from 780 ppm to 680 ppm in Pine Run and Sandy Run.
- f. Land treatment and structural measures will reduce flow velocities.
- g. Land used for land treatment and structural works will be saved for wildlife use in this urbanized area.

Adverse Environmental Effects

- a. The covering of 400 feet of stream by the two dams.
- b. The covering of 4,300 feet of stream by the sediment pools of PA-634 and PA-635.
- c. The commitment of 35 acres of land for the dams, emergency spillways, and permanent pools of PA-634 and PA-635. This includes 16 acres of forest land and 19 acres of open land.
- d. The periodic inundation of an additional 54 acres of land and 5,400 feet of stream. This 54 acres of land is composed of 24 acres of woodland and 30 acres of open land.
- e. The disruption of approximately five acres of woodland by borrow areas.
- f. The disruption of approximately nine acres of open land by borrow areas outside the sediment pool. These areas will be revegetated by appropriate grasses to eliminate erosion.
- g. Noise and traffic congestion from construction equipment.
- h. Periodic inundation of the stone building by temporarily impounded floodwater.



VI. ALTERNATIVES

Four alternatives were considered on Pine Run. These alternatives are:

1. Land treatment measures only.
2. Land treatment supplemented with nonstructural measures.
3. Structural measures only.
4. No project.

Land Treatment Measures Only

This alternative consists of assisting urban developers plan and install a satisfactory erosion and sedimentation control plan. Technical assistance would be provided to developers and landowners for onsite plans to minimize erosion and for the installation of those measures specifically needed to promote and maintain vigorous vegetative cover. Developers and landowners would also be encouraged to utilize the natural environmental landscape in their planning and management.

Land treatment measures which could be installed on urban, built-up and other areas, include diversions, debris basins, forest land measures, temporary vegetation, recreation area plantings, subsurface drains, grassed waterways or outlets, wildlife upland habitat management and heavy use area protection. Installation of land treatment measures would be by the landowners on their holdings. Developers would install erosion and sediment control practices during construction to minimize erosion and surface water runoff. They would be encouraged to utilize the natural landscape in their planning. Prior to issuance of work permits, township officials would review and approve development plans to ensure compliance with ordinances and would work with developers to ensure inclusion of appropriate protection.

Impacts of land treatment measures are summarized as follows:

1. Control erosion on future development areas.
2. Reduce flood damage.
3. Minimize future flood runoff.
4. Provide habitat for birds and animals.
5. Provide aesthetic contrast of vegetative plantings and urban structures.

This alternative would avoid all the permanent and temporary adverse environmental effects of the planned project. But, it would have the adverse effect of not preserving the land needed by PA-634 and PA-635 as open space or wildlife habitat.

Land treatment measures are expected to cost \$89,000. Identified flood reduction benefits are estimated to average \$5,000 annually. This alternative would reduce flooding by an estimated two percent which does not meet the sponsors flood control objectives.

Land Treatment Supplemented with Nonstructural Measures

This alternative consists of the land treatment supplemented by nonstructural items.

The land treatment program is identical to the one described in the land treatment measures only alternative.

The nonstructural items to be included are:

1. Land use regulations for uplands and flood plains.
2. Flood proofing of individual buildings. 1/
3. Flood insurance.

All elements of this alternative would be conducive to good environmental management.

Land treatment would have identical effects as those listed in the land treatment measures only.

Land use regulations for uplands would protect land resources by prohibiting developments which are beyond the limitations of the soils. This would prevent excessive production of erosion and sediment from new developments. It would also aid in planning improvements which would maintain or even improve man's environments.

Flood plain regulations would insure that only those developments compatible with flood plains can be located there. Some of these uses are: parking lots, wildlife habitat, nature study area and hiking trails. By limiting types of flood plain uses flood damages would not continue to climb, in fact damages could diminish over time.

Upper Dublin Township became eligible for flood insurance in April 1973. Flood insurance is available to residential and commercial property owners. It is available for both real property and contents at subsidized rates. Beyond certain dollar limitations insurance is available at actuarial rates.

When the flood insurance study is completed, it should help spur the enactment of flood plain ordinances. Insuring against damages removes the threat of financial loss from flooding from individual units. This releases financial resources for more productive uses.

1/ Represents individual effort and not group actions.

The nonstructural program would avoid all the adverse environmental effects of the planned project.

This alternative would reduce flood damages by about 65%. It would control excessive rates of erosion and sediment production. The environment could be improved by prohibiting unwise location and density of developments. This alternative does not provide the level of flood protection desired by the sponsors. The estimated cost of installing this alternative is \$590,000.

Structural Measures Only

This alternative consists of building two floodwater retarding structures. One is site PA-634 located on Rapp Run about 600 feet upstream from Highland Avenue, and the other site PA-635 is located on Pine Run about 600 feet upstream from Route 152 at Dresher.

The flood plain area inundated by a 100-year frequency flood would be reduced from 145 acres before project installation to 50 acres after. These areas are located along Pine and Rapp Runs. An additional 50 acres along Sandy Run, downstream from the project, would be protected.

Average annual flood damages would be reduced by 98 percent in the project area and 43 percent along Sandy Run downstream from the project. Flood damage reduction is calculated on a 100-year evaluation period. Properties protected from a recurrence of the 100-year frequency flood would be susceptible to damages from floods of greater magnitude.

The two floodwater retarding structures are expected to accumulate 114 acre feet of sediment over the 100-year evaluation period. Annually, the sediment load of Pine Run would be reduced by 1,250 tons.

The construction and operation of floodwater retarding structures, with reservoir site land clearing, would accelerate the loss of upland wildlife habitat already taking place. However, the overall trend of urban development is irreversible and independent of the proposed watershed development. The 150 acres committed to the structures would not be subject to urban development.

The sediment pools would destroy existing habitat on seven acres of forest land, eleven acres of open land and 4,300 feet of natural stream. In its place, two nine-acre pools suitable for warm water fish will be created. These impoundments would increase the variety of bird life inhabiting the area by attracting waterfowl, marsh and shore birds.

Temporary flood pools would inundate 24 acres of forest land, 30 acres of crop and pasturelands and 5,400 feet of natural flowing stream. Existing habitat would not be disturbed except when floodwaters would be temporarily stored. Generally, when occasional floodwaters are stored, wildlife would be able to find other nearby habitat to their liking. Temporary flood storage would be used for short periods of time and would not endanger the existing vegetative cover and food supplies.

Existing private land ownership precludes public enjoyment of fish and wildlife resources that now exist. If this project is installed, the sponsors would hold for the public a total of 150 acres. This includes two nine-acre pools and 5,400 feet of stream. The sites could be maintained as open space for use by the public. Potential uses are fishing, bird watching, hiking and nature education.

Quantity and quality of water are not expected to change significantly when the project is installed. Site PA-634 and PA-635 would store water in nine-acre sediment pools but not greatly affect stream temperature or low flows.

None of the adverse environmental effects of the planned project would be avoided if this alternative is adopted.

This alternative would meet the sponsors' flood protection objective. However, because it lacks a land treatment program their erosion and sediment reduction objective would not be met.

These structures are estimated to cost \$2,097,000.

No Project

This alternative consists of the ongoing land treatment program. The program is similar to the accelerated land treatment program proposed in the planned project, except on a smaller scale.

Even with the ongoing land treatment the watershed experiences water and related land resource problems. Flood damages would continue at about \$455,000 annually. Sheet erosion would continue to be excessively high with as much as 10 tons per acre per year on cultivated land and 65 tons per acre on land being developed. Sediment from unstabilized stream channels would remain high with an estimated annual yield at the mouth of Pine Run of 210 tons. Also, this alternative has the added adverse effect of not reserving open space and wildlife habitat in this almost completely urbanized watershed.

Net benefits foregone (benefits of a flood control structural program minus the costs) would average \$127,300 annually.



VII. SHORT-TERM VS. LONG-TERM USE OF RESOURCES

During the last two decades, land use has shifted from an agricultural-ly dominated landscape to a highly urbanized environment. The following table shows the changes which have taken place and the expected changes.

<u>Land Use</u>	<u>Percent Land Use</u>		
	<u>1958</u>	<u>1972</u>	<u>1985</u>
Cropland	41	9	0
Grassland	9	3	0
Forest land	16	5	0
Urban and built-up	34	83	100

Within the urban and built-up areas, there are about 680 acres of idle land awaiting development. There are another 670 acres of cropland, grassland and forest land threatened by urban pressures. Urban development is continuing at the rate of about 100 acres per year. There are 206 acres of land (presently classified as forest and urban land) that are in parks dedicated to recreation.

Recently enacted regulations adopted to administer the Pennsylvania Clean Streams Law (Section 102) will have a direct bearing on land use. These regulations require an erosion and sediment plan to be developed and implemented for all earth moving activities. In addition, a Pennsylvania Department of Environmental Resources permit is required for all earth moving activities exposing 25 or more acres at one time. The Pennsylvania Department of Environmental Resources may lower the 25 acre limit for permits at the request of local officials. The Montgomery County Conservation District will review sediment and erosion control plans and provide technical assistance in the preparation and implementation of the plans.

Upper Dublin Township is the unit of government responsible for land use regulations and will be assisted in its duties by both the Conservation District and Soil Conservation Service.

Pennsylvania's Clean Streams Law also prohibits the discharge to the waters of the Commonwealth of any polluttional materials whether from industrial or domestic sources. It also allows the Department of Environmental Resources to regulate any activity which creates a danger of pollution or has a potential for pollution.

The project will reduce flooding as soon as completed and provide open space for the community. The silt during construction will be controlled by appropriate erosion control measures. It will take one growing season for the site to become established with a permanent cover grass.

Through the full implementation of the National Flood Insurance Program and the Flood Disaster Act of 1973 policy and decision makers will be aided and induced to adopt flood plain land use regulations.

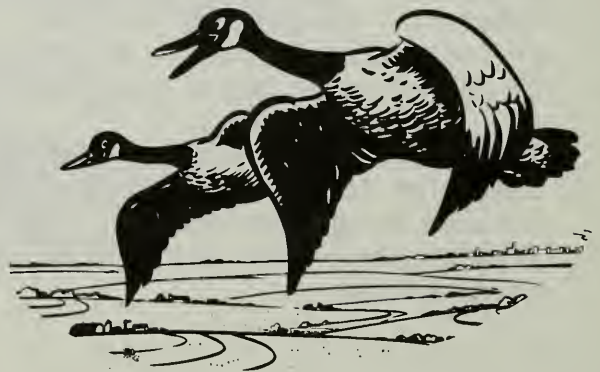
Long term uses of 35 acres under the dams, spillways and permanent pools will be eliminated from any long term multiple use. In addition, another 54 acres of land will be subject to periodic flooding.

The project will enhance the land resources of the watershed from a wildlife habitat standpoint since the areas reserved by the dams, spillways, permanent pools, and flood pools will end up as open space.

The project should continue to offer flood protection well after its 100-year evaluation life. Even though the reservoir trap efficiency is reduced, sediments will deposit and the deposited volumes will gradually encroach on the flood storage capacity of the structure.

The Pine Run Watershed is in the Water Resources Council Region 02 "Middle Atlantic Region" and subregion 04 "Delaware River Basin". The Water Resources Council total designation is therefore, 0204. Within the Pennsylvania section of the Delaware River Basin there are 12 PL-566 projects in various stages of development. The Lackawaxen Tributaries watershed project is completed. There are seven watershed projects in the operations (construction) stage. They are the Brandywine Creek, Brodhead Creek, Green-Dreher, Kaercher Creek, Little Schuylkill, Mauch Chunk, and Neshaminy Creek. There are two watershed projects in the planning stage: Sacony Creek Watershed and Pine Run Watershed. There are also two watersheds with active applications for potential planning: Lower Brodhead Creek and Pocono Creek.

The Pine Run Watershed Project Plan was reviewed and coordinated with appropriate federal, state and local agencies, and is compatible with other water resource projects. The cumulative effect of the watershed project on areas outside the watershed is felt to be the reduction of flooding which should have a stabilizing effect on areas outside the watershed. The watershed does afford employment to those outside the watershed. The cumulative environmental effects within the watershed will include the reduction of flooding, the protecting of open space otherwise used for urban development, the improvement of wildlife habitat through the areas set aside for the structures and the use of land treatment practices.



VIII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

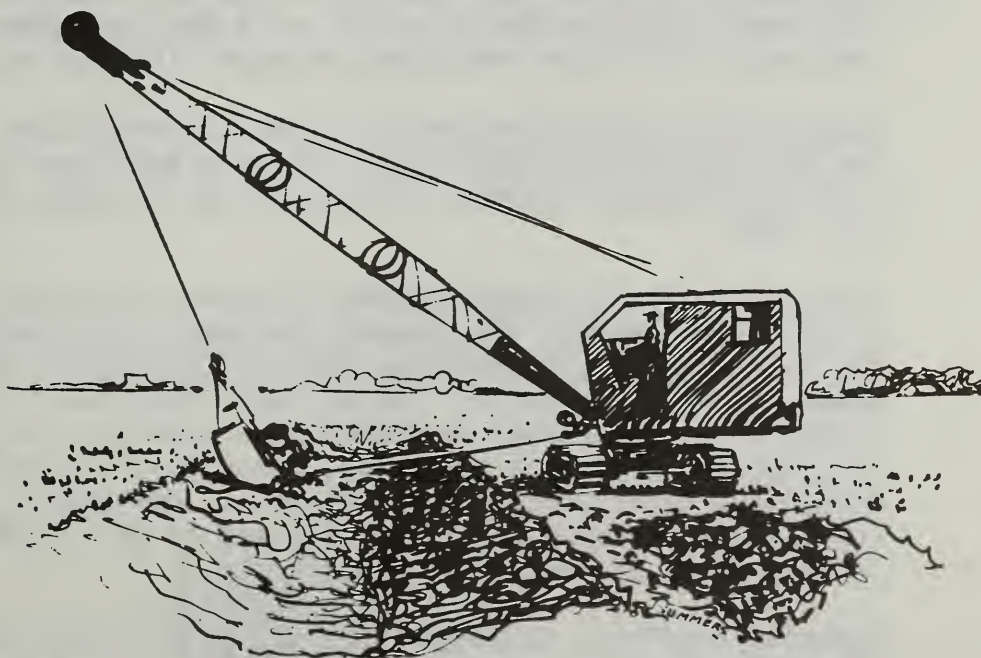
There are 35 acres of open land and woodland used for dams, spillways, and sediment. Acres of each land use committed are shown below:

Site No.	<u>Committed Acres of</u>		Total
	Open land	Forest land	
PA-634	8	12	20
PA-635	<u>11</u>	<u>4</u>	<u>15</u>
TOTALS	19	16	35

There will be a total of 2,300 feet of stream covered or inundated by the two dams and sediment pools. During flood producing storms in the watershed, there may be as much as 75 acres of land inundated in the flood pools of these dams and an additional 4,500 feet of stream temporarily inundated. This periodic flooding will prohibit some intensive land uses. The land areas occupied by dams, sediment pools and emergency spillways are permanently committed.

Labor and some material resources used to construct the structures are irretrievably committed. Capital expenditures and other materials are irreversible committed to the project.

All land developed under PL-566 with federal cost-sharing cannot be sold or disposed of during the evaluated life of the project except to a public agency which will continue to maintain and operate the development for its intended use.



IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

General

In June 1959, the Montgomery County Conservation District and Montgomery County Commissioners submitted an application for the Wissahickon Creek Watershed. Working with the sponsors and Wissahickon Creek Watershed Association a draft plan was prepared in April of 1965. Montgomery County Commissioners appropriated \$30,000 to accelerate the planning process.

In 1965, the Montgomery County Commissioners elected not to support the April 1965 draft plan. At that time it was mutually agreed between the Soil Conservation Service and sponsors to temporarily stop planning the watershed.

In 1966, after considerable amount of flood plain development and some local flooding, interest in planning was revived. In the time elapsed from 1965 to 1968, several criteria changes to the Watershed Protection and Flood Protection Act PL-83-566, the rapid increase of costs, and interest rates caused the project to be reanalyzed for feasibility.

Several of the potential sites inventoried in the 1965 plan had been converted to urban use and would be too costly to reclaim for impoundment sites.

The only remaining potential floodwater retarding structural sites were those located on the headwater streams draining Ambler and those on Pine Run draining the Fort Washington Industrial Park area.

After considering available alternatives, the sponsors elected to develop a watershed plan for Pine Run only. Proposed works of improvement on Pine Run Watershed will function independent but complement subsequent measures proposed for the Wissahickon Creek.

Since 1959, numerous meetings and much correspondence were carried out. The Wissahickon Valley Watershed Association Steering Committee held public meetings on 10/62, 11/63, 3/64, 4/64, 6/64, 11/64, 6/65, 5/66 and 11/66.

There have been at least another 20 various meetings in the process of plan formulation. The groups involved in the meetings included the Soil Conservation Service, Corps of Engineers, Montgomery County Commissioners, the public, Pennsylvania Department of Health, Pennsylvania Department of Commerce, Wissahickon Valley Watershed Association, concerned townships, Pennsylvania Turnpike Commission, Montgomery County Conservation District, Montgomery County Planning Commission, Sheraton Motor Inn, Sisters of Mercy and the Pennsylvania Department of Environmental Resources.

Agencies supplying input and comments on the plan include: U. S. Department of Agriculture's Forest Service, and the Agricultural

Stabilization and Conservation Service; U. S. Fish and Wildlife Service of the U. S. Department of Interior; U. S. Department of Health, Education and Welfare; Pennsylvania Department of Health; Pennsylvania Fish Commission; Pennsylvania Game Commission; Bureau of Forestry of the Pennsylvania Department of Environmental Resources (formerly Forest and Waters) and the Pennsylvania Turnpike Commission.

The initial draft plan, completed in April 1965, was not implemented because of the lack of local support.

Periodic newspaper articles and Wissahickon Watershed Association Newsletters kept the public informed of the lack of progress.

The Delaware River Basin Report, as revised May 1961, identifies Pine Run Sites GT-4 and GT-13 for inclusion as Small Control Projects (see Table VII-1 of the Main Report Vol. I).

North Atlantic Region (NAR) report shows the Wissahickon Creek Watershed as an authorized project (see Appendix F, Figure F-22.)

Erosion, sediment and flood prevention needs for this area have been identified by other agency studies as shown above.

Several agencies, organizations and private individuals were contacted concerning the location and knowledge of archeological and historical sites; National Park Service, Archeological Research; Pennsylvania Historical and Museum Commission; B. Louise Meschter, Naturalist/Editor, Wissahickon Valley Watershed Association, and Elizabeth Righter, Archaeological Consultant.

An informal field review was held in December 1974. Cooperating or concerned federal, state, and local agencies were invited to participate in the review by providing inputs to the draft plan and the unsigned draft environmental impact statement.

In January 1975 a public informational meeting was held. The purpose for this meeting was similar to the field review but provided the opportunity for the general public and private organizations to provide inputs.

Both these meetings were advertised in local newspapers prior to the meeting dates. Inputs and comments were recorded and many were incorporated into the draft plan and signed draft environmental impact statement.



Discussion and Disposition of Each Comment on Draft Environmental
Impact Statement

Comments were requested from the following agencies:

U. S. Department of the Army -----Responded

U. S. Department of Commerce

U. S. Department of Health, Education and Welfare

U. S. Department of the Interior-----Responded

U. S. Department of Transportation-----Responded

Environmental Protection Agency-----Responded

Advisory Council on Historic Preservation

Delaware River Basin Commission

Federal Power Commission

Office of Equal Opportunity; U. S. Department of Agriculture

Water Resources Council

State Conservation Commission of the Pennsylvania Department
of Environmental Resources (Governor's Designated Agency
for Reviews and Approval of PL-566 Projects.) -----Responded

Governor's Budget Office -----Responded
(State Clearinghouse)

Delaware Valley Regional Planning Commission
(Regional Clearinghouse)

Montgomery County Planning Commission -----Responded

Upper Dublin Township Commissioners

Pennsylvania Turnpike Commission -----Responded

Private organizations providing comments are:

Trout unlimited

Discussion and Disposition of Comments

FEDERAL AGENCIES

U. S. Army Corps of Engineers

Comment:

"We have reviewed this work plan and foresee no conflict with any projects or current proposals of this Department. The draft of the environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned."

No response necessary.

U. S. Coast Guard

Comment 1:

"There is a possibility that a U. S. Coast Guard bridge permit may be required for the conduits and bridges mentioned in Item I on page 15. Before a determination of navigability can be undertaken, more detailed information is required as to the exact locations being considered for such structures. Any historical information which might be available concerning navigational history of Pine Run, Rapp Run, Sandy Run, or Wissahickon Creek, would be helpful as well."

Response 1:

The bridges and conduits mentioned on page 15 of the EIS are temporary. They are to be used by construction equipment to keep from having to cross through the stream.

Page 21 of the EIS states both Rapp Run and Pine Run are intermittently flowing streams over much of their course. From the sites downstream they are however perennially flowing. PA-634 has a drainage area of 1,184 acres and PA-635 has a drainage area of 1,216 acres, therefore, it seems unlikely these streams are navigable.

Exhaustive data searches during project development, which includes a historical study by a professional archaeologist, revealed no data concerning navigation on Rapp Run or Pine Run.

Comment 2:

"The section on 'Environmental Setting' omits mention of commercial or recreational boating on any of the waterways involved (as well as the width and depth of the waterways). Will there be any adverse impact to boating, especially as a result of the dams?"

FEDERAL AGENCIES
U. S. Coast Guard

Response 2:

No data was uncovered which indicated any commercial use or recreational boating on Rapp Run or Pine Run.

Page 21 of the EIS describes stream characteristics of various sections of the two streams. The stream channel at both the proposed sites is four to six feet wide with normal water depths of six to 12 inches.

U. S. Department of Interior

Comment 1:

"We commend the Soil Conservation Service for their inclusion of extensive non-structural and land treatment measures into the project work plan. Flood plain management and zoning are essential parts of any comprehensive flood protection program. Wise planning and use of lands within the watershed will greatly reduce the potential damage from floods in the future."

No response necessary.

Comment 2:

"On page nine of the work plan we suggest that the third paragraph be revised to more fully explain the surface area - reservoir storage relationship. It appears that 370 acre-feet of floodwater storage and 160 acre-feet of fish and wildlife storage are separate volumes. In reality, the 160 acre-feet is part of the 370 acre-feet at a surface area of 28 acres."

Response 2:

The 160 acre-feet and the 370 acre-feet are separate volumes. The 28 acre permanent pool is composed of the 72 acre-feet for sediment accumulation and the 160 acre-feet for fish and wildlife storage.

It should be pointed out that the 28 acre multiple purpose dam is part of the abbreviated environmental quality plan which is part of the addendum. This multiple purpose configuration represents a fuller use of site potential at PA-634. Nevertheless, it is the sponsor's option and desire to develop the site for single purpose flood prevention.

Comment 3:

"The work plan and draft statement accurately describe mineral resources but do not discuss any restrictions upon future development of those resources within the watershed. However,

FEDERAL AGENCIES

U. S. Department of Interior

because these resources are primarily sand and gravel that is available elsewhere in the region in greater quantity and quality, we believe that no significant impact will result."

No response necessary.

Comment 4:

"Although construction of the retarding structures are described and generalized cross-sections are shown, there are no engineering drawings showing the dimensions of these relatively large structures. The work plan and final environmental statement would be improved by the addition of this information."

Response 4:

Table 3 (Plan, page 86) shows structural data of the proposed dams.

Detailed engineering drawings and exact dimensions will be developed during final design in the operations phase. This program is presently in the planning phase.

Comment 5:

"Geologic conditions and possible geologic hazards have been adequately considered with respect to the proposed project. Also we anticipate no long lasting adverse impacts on the water resources of the affected streams."

No response necessary.

Comment 6:

"The environmental statement has a good list of wildlife species potentially present within the watershed and an adequate description of fishery resources. The description of plant species and habitat types affected by the project is well done also."

No response necessary.

Comment 7:

"Although the draft states that no eligible National Register Properties exist in the project area, Page 34, a structure built by Dr. Thomas Wynn (about 1682) will apparently be inundated, and a mid-18th century structure is also located in the area. The historical significance of these properties and the project's impact on them should be clarified.

FEDERAL AGENCIES
U. S. Department of Interior

The final statement should show evidence of consultation with the State Historic Preservation Officer (SHPO) who is Mr. William J. Wewer, Executive Director, Pennsylvania Historical and Museum Commission, Box 1026, Harrisburg, Pennsylvania 17108, concerning these properties and any other cultural resources in the area within the zone of the project's impact. The final statement should also reflect what other steps have been taken to comply with the Guidelines for the Protection of Historic and Cultural Resources (36 CFR 600) in addition to those already mentioned in the draft."

Response 7:

The draft work plan and draft EIS states an archeological and historical investigation is being done by a competent authority and results included in the final statement.

Results of the investigation have been included and show that a manor house (Dr. Thomas Wynn) appears eligible for inclusion in the National Register of Historic places. This house is in the watershed but unaffected by either PA-634 or PA-635.

In response to an Informal Field Review, William J. Wewer, Executive Director, Pennsylvania Historical and Museum Commission, wrote:

"With one possible exception, the report adequately identifies the historical and archeological values involved with the project, and the effect of the latter on them. The possible exception is a small stone building located in PA-634, just off Camp Hill Drive. If this structure will be effected by the project, please let us know and we will be pleased to determine whether or not it is eligible for entry on the National Register of Historic Places as authorized by the National Historic Preservation Act of 1966."

Mr. Wewer was requested to determine whether or not this "small stone building" is eligible for inclusion in the National Register.

In March 1975 Mr. Wewer replied:

"We have completed our evaluation of the small house in your project PA-634, Pine Run Watershed, Montgomery County, Pennsylvania.

Because so little is left of the original woodwork of the building, and it has otherwise suffered serious losses to its integrity, we do not consider it to be eligible for inclusion on the National Register of Historic Places."

FEDERAL AGENCIES
U. S. Department of Interior

Comment 8:

"The discussion of recreation resources in the study area is adequate."

No response necessary.

Comment 9:

"The statement concerning irreversible and independent trends toward urbanization seems contradictory in view of the non-structural measures of "zoning" and "land use regulations" recommended as part of the project. The trend toward urbanization could be curbed by setting aside natural areas and restricting development on the remaining 680 acres of open land."

Response 9:

The structure sites are located on areas set aside by the township as open space. The township does not desire to set aside the 680 acres of open land now available to open space.

Comment 10:

"We agree that urbanization has suppressed animal populations in the watershed. Only 19 percent of Montgomery County is still wooded, and less than 5 percent of the watershed remains wooded. The existing abandoned fields and wooded areas can help to prevent sheet erosion and reduce stream sedimentation while providing attractive areas for birds, mammals and other wildlife. The wooded areas would have maximum benefit to wildlife if left in their natural state."

No response necessary.

Comment 11:

"The following statement needs further clarification: 'Lack of water impoundments is also responsible for the lack of waterfowl, marsh and shore birds.' These birds also require habitat for nesting and feeding in order to sustain viable populations within the watershed. Impoundments alone may provide little more than resting areas for a few water-dependent birds passing through the watershed."

Response 11:

Pages 50 of the Plan and 40 of the EIS have been changed to recognize that along with the lack of water impoundments the lack of nesting and feeding habitat is the cause for the absence of waterfowl.

FEDERAL AGENCIES
U. S. Department of Interior

Comment 12:

"It is not clear how effective the structural measures will be in reducing sediment in Pine Run. The existing turbidity level is 780 ppm. With the project, it is expected that the sediment load will be reduced by 1,250 tons per year and that the turbidity level will be decreased to 680 ppm per year. This would imply that only larger materials would be settled out and fine-grained sediment would still remain in suspension. The fine materials and associated turbidities are the ones that suffocate aquatic invertebrates, clog fish gills, and reduce plant productivity. We question whether the proposed sediment reduction will significantly benefit fishery resources downstream."

Response 12:

The plan and EIS states the effectiveness of the structure in reducing sediment; sediment load will be reduced by 1,250 tons per year. Sediment concentrations and not turbidity will be reduced from 780 ppm to 680 ppm.

Wissahickon Creek is the first significant stream fishery downstream from Pine and Sandy Runs. At the point of confluence Pine Run drainage represents less than 10% of the total Wissahickon drainage area. Although Pine Run is a small part of the total, sediment reduction should have a small positive impact on the Wissahickon fishery.

Page 25 of the EIS, states the influence of pollution and other water quality factors on fish and wildlife resources is negligible.

Comment 13:

"There seems to be a contradiction concerning the enhancement of wildlife resources. Both the environmental statement and the work plan emphasize how beneficial any vegetation in an urbanized area is to wildlife; however, the project will permanently destroy 35 acres and adversely affect 115 acres of the few remaining natural woods and abandoned fields left within the watershed."

Response 13:

It is incorrect to classify the 25 acres to be used for the dam, emergency spillway and sediment pool as being permanently destroyed. Page 68 of the Plan states "The embankment, emergency spillway and construction area will be seeded for protection from erosion and for wildlife habitat." The 18 acres of sediment pools is changing from land to water habitat. The existence of water habitat probably enhances the area for wildlife.

FEDERAL AGENCIES

U. S. Department of Interior

Except for 14 acres needed for borrow, which will be revegetated, the 115 acres mentioned as being adversely affected will not be disturbed. Fifty-four acres is for temporary flood storage of which portions will be periodically flooded.

Comment 14:

"The creation of a good warm-water fishery from either impoundment is questionable. The ponds will have long turnover rates during the summer and fall when discharges drop below 3 cfs. The ponds will be enriched by runoff from the urbanized area; initial water quality data indicate high phosphates and potentially high nitrates. Summer blooms of algae and nuisance plants are possible in shallow ponds under these conditions."

Response 14:

The two 9 acre sediment pools have not been described as creating good warm-water fisheries.

Comment 15:

"The grubbing and clearing of vegetation in waters less than 2 feet deep will severely limit the value of the impoundment to water-dependent birds. The shoreline should be planted with emergent and/or submergent vegetation to provide a food source to waterfowl and marsh and shore birds."

Response 15:

The proposed clearing and grubbing of pool areas less than 2 feet deep was intended to eliminate insect breeding areas if this should become a problem.

Since this is an urban area site development for wildlife use must be tempored by other environmental consideration.

Comment 16:

"None of the alternatives examined the possibility of using check dams, weirs, etc., to help control stream sedimentation. Channelized areas could be stabilized to prevent further stream bank erosion, and sheet erosion could be controlled through land treatment and non-structural measures. There was no consideration given to the use of levees or dikes to help contain flood waters. The use of levees would have the added benefit of avoiding construction of one or both flood retarding structures and the subsequent loss of 35 acres of natural woods and abandoned fields. These areas could then be preserved in their natural state for the enjoyment of all."

FEDERAL AGENCIES
U. S. Department of Interior

Response 16:

Check dams, etc., in the stream would not control the major source of sediment. Stream bank erosion on Rapp Run comprises only 2% of the total sediment in this tributary. On Pine Run stream bank erosion comprises only 7% of the total sediment in this tributary.

Stream sedimentation was not a major objective in the project even though over 90% of stream sedimentation will be controlled below the structure.

Diking as an alternative would be as disruptive to wildlife and people as impoundments, if not more so. The need for internal drainage and pump stations would require more operation and maintenance and have the potential for malfunctioning. Unlike dams, the exceeding of the design capacity of a dike creates a greater disaster than without it. The increase in flow depth caused by diking would increase flow velocities and result in increase stream erosion downstream of the project area. Also a greater percentage of the sediment originating in the watershed would be transported downstream.

With diking in the project area, flood benefits to those areas below the project boundary would be foregone, with the added potential for increased damage.

Diking would also require the use of some 15 to 20 acres for the dikes themselves along with an additional 15 to 20 acres for use as borrow areas.

The embankment and spillway areas will convert 9 acres of forest land and 8 acres of open land to 17 acres of wildlife use seeded with selected grasses, legumes, and woody vegetation to stabilize and enhance the aesthetics of these earthen flood control structures. The sediment pools convert 7 acres of forest land and 11 acres of open land to 18 acres of water with the sponsor option of leaving these sediment pools dry and in a natural state. The pool areas used for borrow will be seeded to the appropriate vegetation as recommended by a wildlife specialist.

FEDERAL AGENCIES

U. S. Environmental Protection Agency

Comment:

"We have no objections to the proposal, as presented in this document. We have placed the project in EPA Reporting Category LO-1. This means that in addition to the lack of objections concerning the plan we believe the statement adequately describes the work to be performed."

No response necessary.

STATE AGENCIES

Pennsylvania Department of Environmental Resources (through State Clearinghouse)

Comment 1:

"No significant or adverse impact is anticipated by the implementation of this project."

No response necessary.

Comment 2:

"The report makes no mention of Commonwealth participation in the providing of funds for the sponsor's cost (Montgomery County)."

Response 2:

As of this time no Commonwealth funds have been allocated to this project.

Comment 3:

"In the Office of State Planning and Development, Region 1, which is comprised of Chester, Delaware, Philadelphia, Bucks, and Montgomery Counties, there is no State forest land in any of these counties and there are over 26,000 acres of parklands.

Information presented on recreation resources is extremely outdated. Five new State parks have been opened by this region since the 1969 data was released.

New State wide recreation plan will provide more updated data."

Response 3:

The data concerning State forest land and acres of State park land appear on page 35 of the draft EIS and page 45 of the plan. These sections were changed to reflect data contained in this comment.

STATE AGENCIES

Pennsylvania Department of Environmental Resources

According to State officials the "New State wide recreation plan" referred to will not be available until late fall of 1975.

Comment 4:

"The impact statement should include a map delineating the different land use categories resulting from the project such as urban, temporary flood pool, permanent pool, locations of land treatment measures, proposed open land, access points, etc."

Response 4:

Land use within the watershed is dynamic. Since no suitable means exist to constantly update maps in the plan or EIS it is much more desirable to depend on land use maps kept by the township or county which are continually updated.

The approximate location of the proposed dam sites are shown on the Project Map which is part of both the plan and EIS. The approximate area up to the top of dam elevation is also shown.

Location of where the land treatment items will be installed cannot be shown. Items under this phase of the program are to be installed wherever and whenever needed. Even though it is possible to foresee considerable development in the watershed and the need for conservation land treatment it is impossible to determine where or when the development will take place.

Comment 5:

"The impact statement should discuss the affects on the base flows of the streams which would result when all urbanized areas are placed on public sewers."

Response 5:

The exact contribution to the base flows of the watershed from septic fields and package treatment plants is not known. Much of the stream length above each structure now experience intermittent flow. Lack of effluent could lengthen those periods when no flow occurs. The absence of this effluent during flow periods should more than offset the lose in base flows during dryer seasons.

Comment 6:

"The proposed project should have no adverse affects on the ground water in this area."

STATE AGENCIES

Pennsylvania Department of Environmental Resources

Geologic conditions have been described adequately and should have no adverse effects on the project."

No response necessary.

Comment 7:

"The noise levels could become a nuisance to nearby residences, and therefore should be minimized.

The proposed project must be done in compliance with the Department of Environmental Resources rules and regulations regarding fugitive dust emissions and erosion control."

Response 7:

All state and federal regulations relating to the proposed works will be complied with.

Comment 8:

"The Department of Environmental Resources retains an interest in this project and desires to be informed of any adverse environmental effects encountered or anticipated in the further development of this project."

Response 8:

The Department of Environmental Resources will be notified upon the development of or anticipation of the existence of adverse environmental effects.

Pennsylvania Fish Commission (through the State Clearinghouse)

Comment 1:

"The subject material has been reviewed by the Pennsylvania Fish Commission, and we have no objections to the general program as planned.

Neither Rapp Run nor Pine Run support a fishery in the area involved and, therefore, the dams will not have other than a temporary siltation effect. They should decrease siltation below the dams as much silt will settle out in the impoundments. Also, proposed upstream land improvements should lessen siltation."

No response necessary.

STATE AGENCIES

Pennsylvania Fish Commission

Comment 2:

"There seems to be some discrepancy as to the size of the pool of PA-634. Will it have a 9 acre sediment pool or a 28 acre recreational pool? There also is some chance now that these may be dry dams."

Response 2:

The 28 acre recreational lake is mentioned in the Addendum attached to the Plan. It is part of an Abbreviated Environmental Quality Plan. The 28 acre lake represents a fuller use of the site potential of PA-634. Nevertheless the sponsors want the site developed for single purpose flood prevention.

It is the option of the sponsors to have either a 9 acre wet sediment pool or a dry dam.

Comment 3:

"This is an extremely urbanized and industrialized area, and these may soon represent the major open spaces."

No response necessary.

Comment 4:

"The statement is made that where 145 acres are now flooded by a 100 year flood along Pine and Rapp Runs only 50 will be flooded after the project. Also, another 50 acres will be protected on Sandy Run. This sounds like they are protecting land so it can be developed. Flood control must be to protect developed land and never to protect land for development. This can lead to even greater damage if a flood of greater magnitude occurs."

Response 4:

The statements referring to the area protected from the 100-year flood is a physical fact. Much of the land protected is already developed. This programs purpose is not to protect land for development. No benefits from land protected for development were use for project justification.

Pennsylvania State Conservation Commission

Comment:

"We have reviewed the Work Plan and draft Environmental Statement for the Pine Run Watershed Project, Montgomery County, Pennsylvania. The Soil Conservation Service should be congratulated for

STATE AGENCIES

Pennsylvania State Conservation Commission

preparing a comprehensive program to abate flood damage in a difficult watershed area.

The system of impoundment and nonstructural techniques should provide maximum benefits to local people. Since urbanization is taking place at a rapid rate, the erosion and sediment control preventative measures are an important part of the plan. We strongly support this project feature.

All significant environmental consequences have been addressed in the draft Environmental Impact Statement and we have no specific comments to make at this time."

No response necessary.

Pennsylvania Turnpike Commission

Comment:

"It appears that all Commission criteria dating back to 1963 has been incorporated in the documents. Our last reply on this matter was by letter March 17, 1971. A copy is attached. We repeat our request to review the construction plans when the project is authorized and advances to the final design stage. We expect our comments will be confined to items adjacent or within our right-of-way such as flowage easements, stone slope protection, and the location of the permanent security fencing.

We, therefore, have no objections to the contents of either document submitted under date of February 14, 1975."

Response:

The final design of PA-635 will be submitted to the Commission for review and approval of those items affecting the Pennsylvania Turnpike.

LOCAL AGENCIES

Montgomery County Planning Commission

Comment 1:

"Since our last correspondence, we have become aware of a waste-water facilitie study currently being conducted in the watershed. Coordination between the two programs is essential to insure that conflicting planning goals are not being pursued."

LOCAL AGENCIES

Montgomery County Planning Commission

Response 1:

The Soil Conservation Service is in full agreement with the need to coordinate the two programs. Betz Environmental Engineers, the consulting firm doing the wastewater facilities study, has been contacted. No conflict between programs is apparent. However, a coordinating between the consultant and the Service will continue during subsequent stages of development.

Comment 2:

"We also note that the section on Nonstructural Measures has been modified to more accurately reflect the role of the township in land use planning and regulation.

In view of these changes to the Work Plan please accept our endorsement of the project."

No response necessary.

PRIVATE ORGANIZATIONS

Trout Unlimited

Comment:

"The Draft EIS was reviewed by the State Council of Trout Unlimited this past weekend and since construction measures will not affect or degrade any existing trout water in the Pine Creek area we wish to make no adverse comment."

No response necessary.

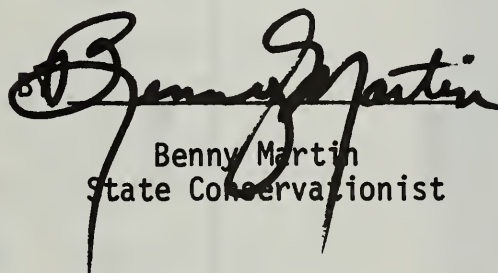
X. LIST OF APPENDICES

Appendix A - Comparison of Benefits and Costs for Structural Measures

Appendix B - Project Map

Appendix C - Letters of Comment Received on the Draft Environmental Statement

XI. APPROVED BY


Benny Martin
State Conservationist

DATE

6/19/75

APPENDIX A - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Pine Run Watershed, Pennsylvania












(Dollars) ^{1/}

Evaluation Unit	Damage Reduction ^{2/}	Secondary	Total	Average Annual Cost	Benefit Cost Ratio
PA-634) PA-635)	230,000	23,000	253,000	120,100	2.1 to 1.0
Project Admin.	-	-	-	5,600	-
GRAND TOTAL	230,000	23,000	253,000	125,700	2.0 to 1.0



^{1/} Price Base: 1975

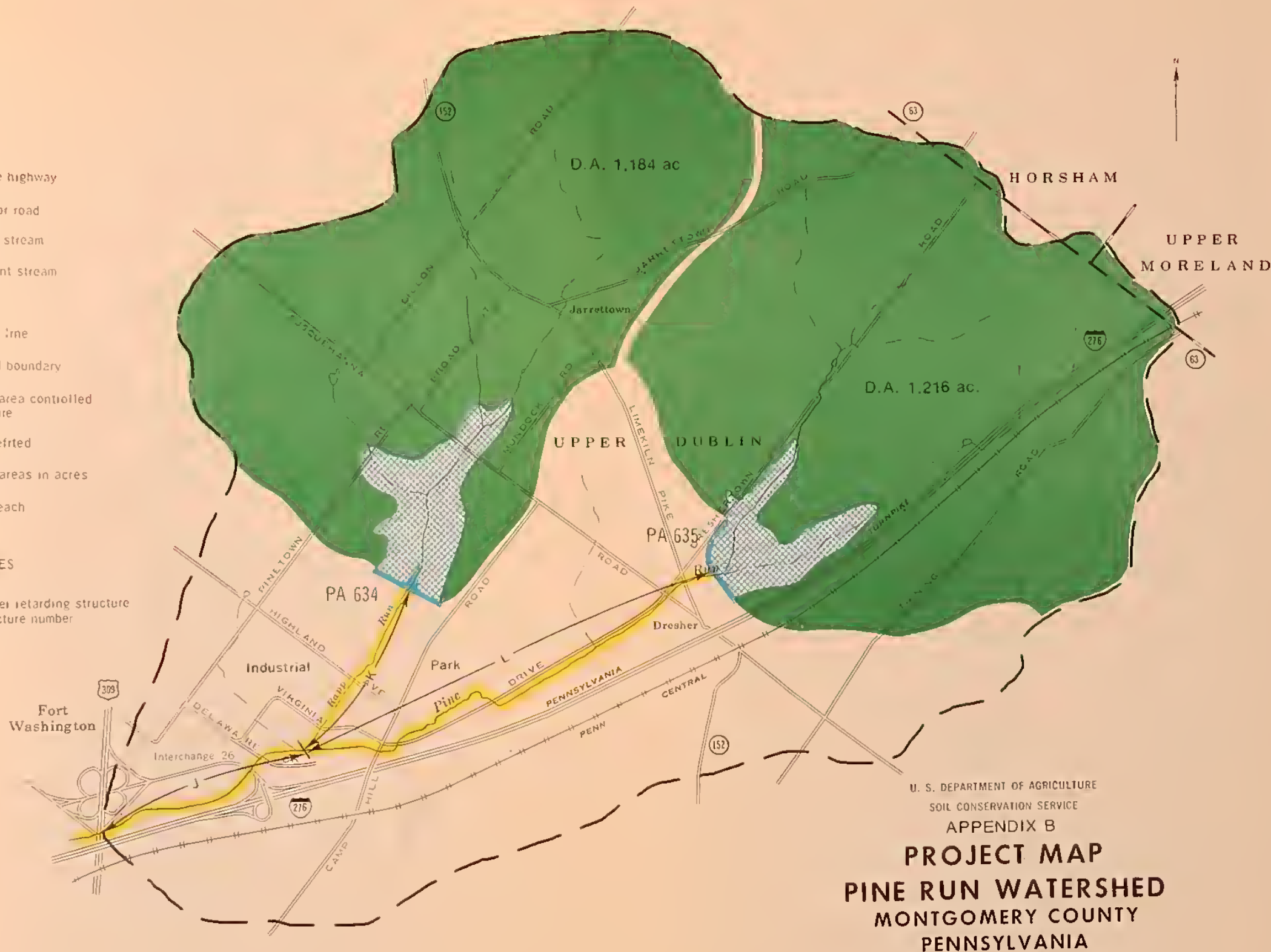
^{2/} In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of \$5,000 annually.

LEGEND

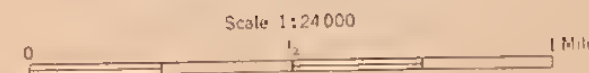
-  Multi-lane highway
-  Good motor road
-  Perennial stream
-  Intermittent stream
-  Railroad
-  Township line
-  Watershed boundary
-  Drainage area controlled by structure
-  Area benefited
-  D.A. Drainage areas in acres
-  Damage reach

PROJECT MEASURES

-  Floodwater retarding structure and structure number
-  PA 634



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
APPENDIX B
PROJECT MAP
PINE RUN WATERSHED
MONTGOMERY COUNTY
PENNSYLVANIA



8,N-10,008

Rev. March 1975
July 1973



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310



Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the Administrator of the Soil Conservation Service, by letter of 14 February 1975, requested the views of the Secretary of the Army on the work plan for Pine Run Watershed, Pennsylvania.

We have reviewed this work plan and foresee no conflict with any projects or current proposals of this Department. The draft of the environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned.

Sincerely,

A handwritten signature in cursive script, reading "Charles R. Ford".

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)







DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

17 APR 1975

Mr. Benny Martin
State Conservationist
Soil Conservation Service
Box 985
Federal Square Station
Harrisburg, Pennsylvania 17108

Dear Mr. Martin:

This is in response to your letter of 14 February 1975 addressed to Commandant, U. S. Coast Guard concerning a draft environmental impact statement for Pine Run Watershed, Montgomery County, Pennsylvania.

The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. The Coast Guard had the following comments to offer:

"There is a possibility that a U. S. Coast Guard bridge permit may be required for the conduits and bridges mentioned in item 1 on page 15. Before a determination of navigability can be undertaken, more detailed information is required as to the exact locations being considered for such structures. Any historical information which might be available concerning navigational history of Pine Run, Rapp Run, Sandy Run, or Wissahickon Creek, would be helpful as well.

"The section on 'Environmental Setting' omits mention of commercial or recreational boating on any of the waterways involved (as well as the width and depth of the waterways). Will there be any adverse impact to boating, especially as a result of the dams?"

The Department of Transportation has no other comments to offer nor do we have any objection to this project. The final environmental impact statement, however, should address the concerns of the Coast Guard.

The opportunity to review this draft statement is appreciated.

Sincerely,

W E Caldwell
W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant

SC _____
DSC _____
ASC (Op.) _____
ASC (WS-RC&D) *VCC*
SAO _____
SRC _____
SCE _____
SSS _____
PIC _____

Kirkaldie LK



4. Date

5. Time

6. Place

7. Description of the event or activity

8. Name of the person or organization

9. Address of the person or organization

10. City

11. State

12. Country

13. Zip code

14. Phone number

15. Fax number

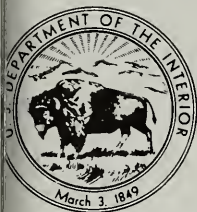
16. E-mail address

17. Signature

18. Date

19. Name

20. Title



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

SC
DSC
ASD (Op.)
ASD (WG-RC&D)
DAO
SRO
SOE
SSS
PIO

In Reply Refer to:
ER-75/153

Dear Mr. Martin:

Thank you for your letter of February 14, 1975, requesting our views and comments on the work plan and draft environmental statement for Pine Run Watershed, Montgomery County, Pennsylvania. We have comments on both documents.

Work Plan

We commend the Soil Conservation Service for their inclusion of extensive non-structural and land treatment measures into the project work plan. Flood plain management and zoning are essential parts of any comprehensive flood protection program. Wise planning and use of lands within the watershed will greatly reduce the potential damage from floods in the future.

On page nine of the work plan we suggest that the third paragraph be revised to more fully explain the surface area - reservoir storage relationship. It appears that 370 acre-feet of floodwater storage and 160 acre-feet of fish and wildlife storage are separate volumes. In reality, the 160 acre-feet is part of the 370 acre-feet at a surface area of 28 acres.

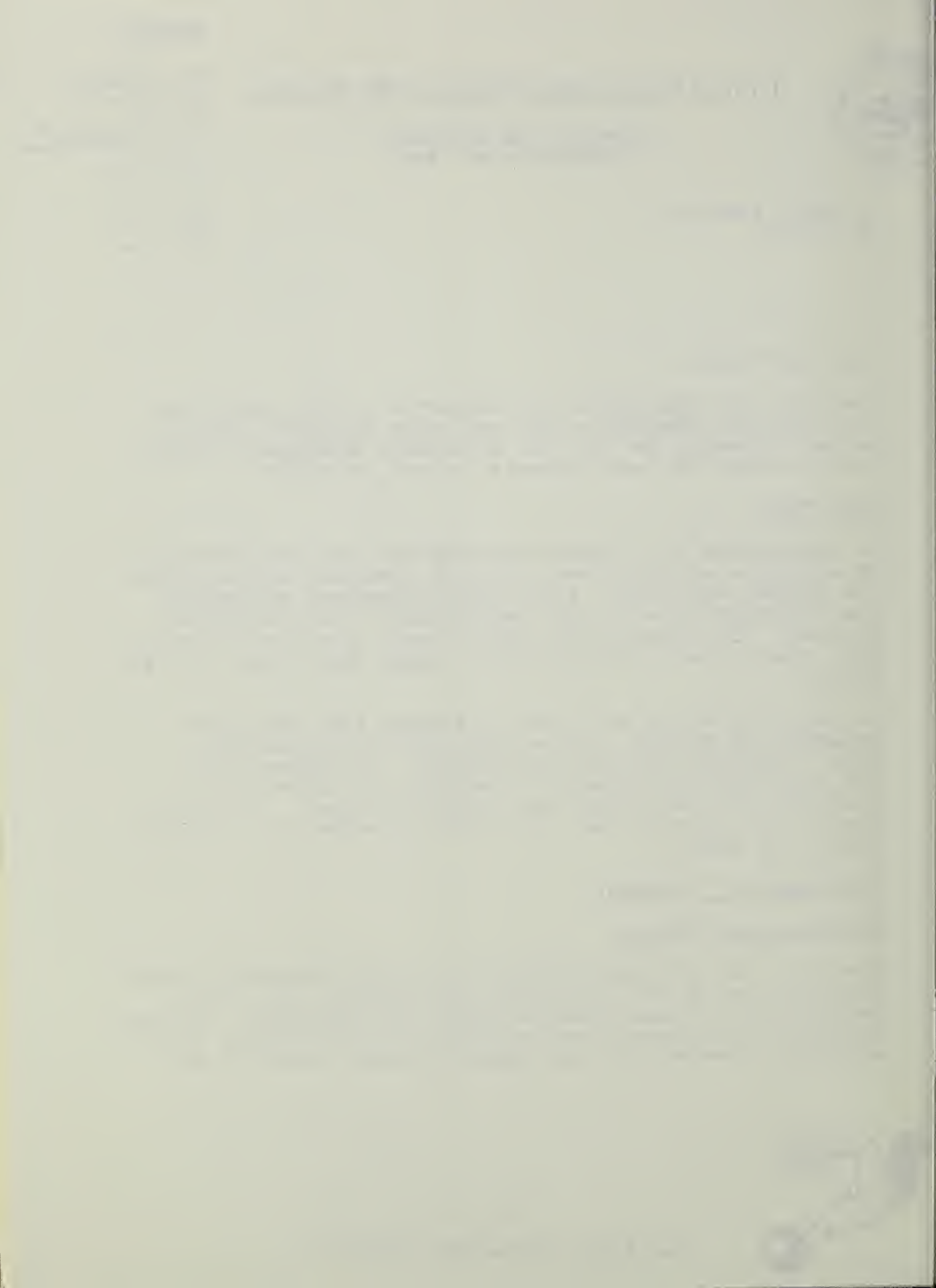
Environmental Statement

Environmental Setting

The work plan and draft statement accurately describe mineral resources but do not discuss any restrictions upon future development of those resources within the watershed. However, because these resources are primarily sand and gravel that is available elsewhere in the region in greater quantity and



Save Energy and You Serve America!



quality, we believe that no significant impact will result. Although construction of the retarding structures are described and generalized cross-sections are shown, there are no engineering drawings showing the dimensions of these relatively large structures. The work plan and final environmental statement would be improved by the addition of this information.

Geologic conditions and possible geologic hazards have been adequately considered with respect to the proposed project. Also we anticipate no long lasting adverse impacts on the water resources of the affected streams.

The environmental statement has a good list of wildlife species potentially present within the watershed and an adequate description of fishery resources. The description of plant species and habitat types affected by the project is well done also.

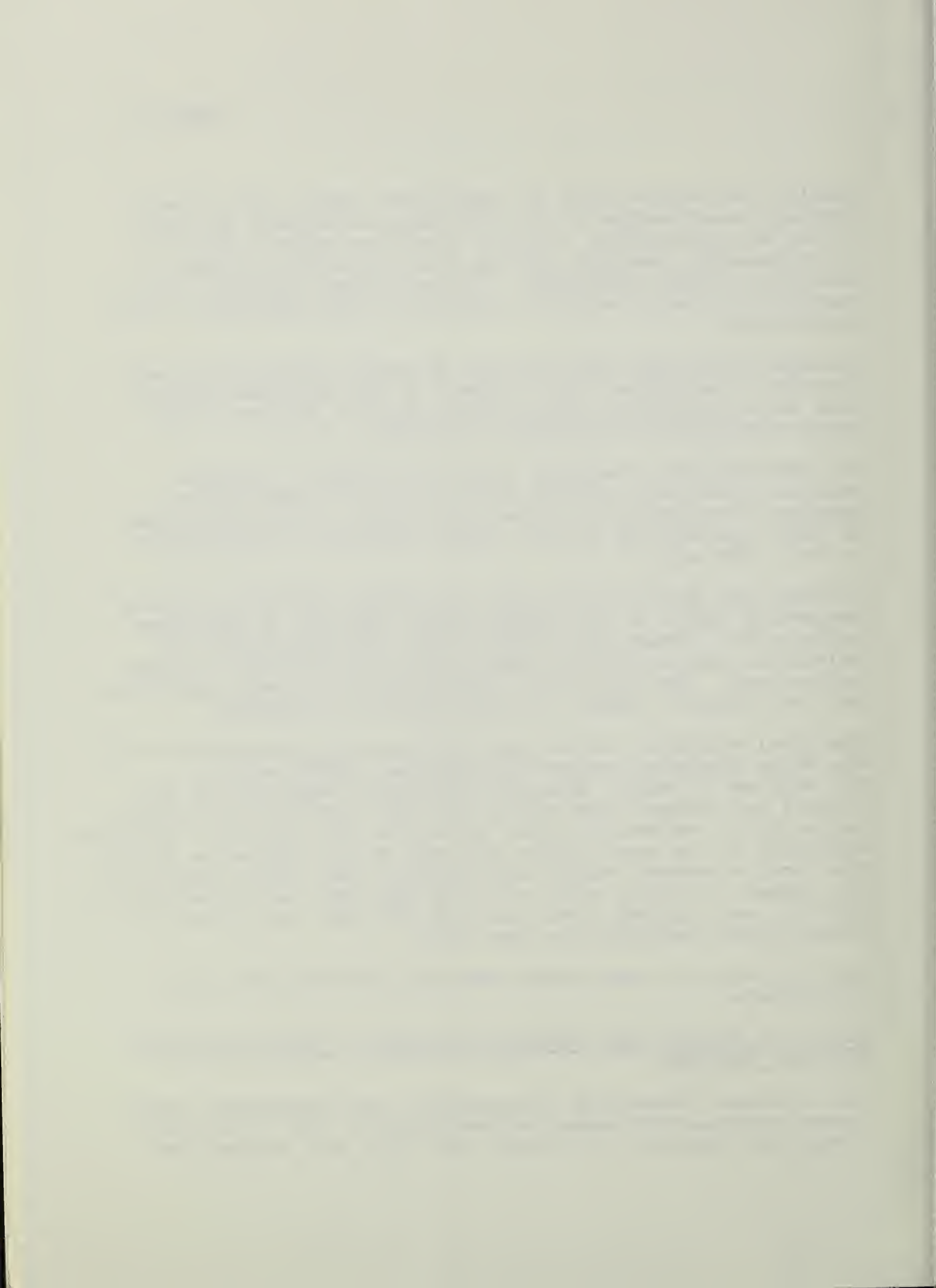
Although the draft states that no eligible National Register Properties exist in the project area, Page 34, a structure built by Dr. Thomas Wynn (about 1682) will apparently be inundated, and a mid-18th Century structure is also located in the area. The historical significance of these properties and the project's impact on them should be clarified.

The final statement should show evidence of consultation with the State Historic Preservation Officer (SHPO) who is Mr. William J. Wewer, Executive Director, Pennsylvania Historical and Museum Commission, Box 1026, Harrisburg, Pennsylvania 17108, concerning these properties and any other cultural resources in the area within the zone of the project's impact. The final statement should also reflect what other steps have been taken to comply with the Guidelines for the Protection of Historic and Cultural Resources (36 CFR 800) in addition to those already mentioned in the draft.

The discussion of recreation resources in the study area is adequate.

Water and Related Land Resource Problems - Plant and Animal Resource Problems

The statement concerning irreversible and independent trends toward urbanization seems contradictory in view of the non-structural measures of "zoning" and "land use regulations"



recommended as part of the project. The trend toward urbanization could be curbed by setting aside natural areas and restricting development on the remaining 680 acres of open land.

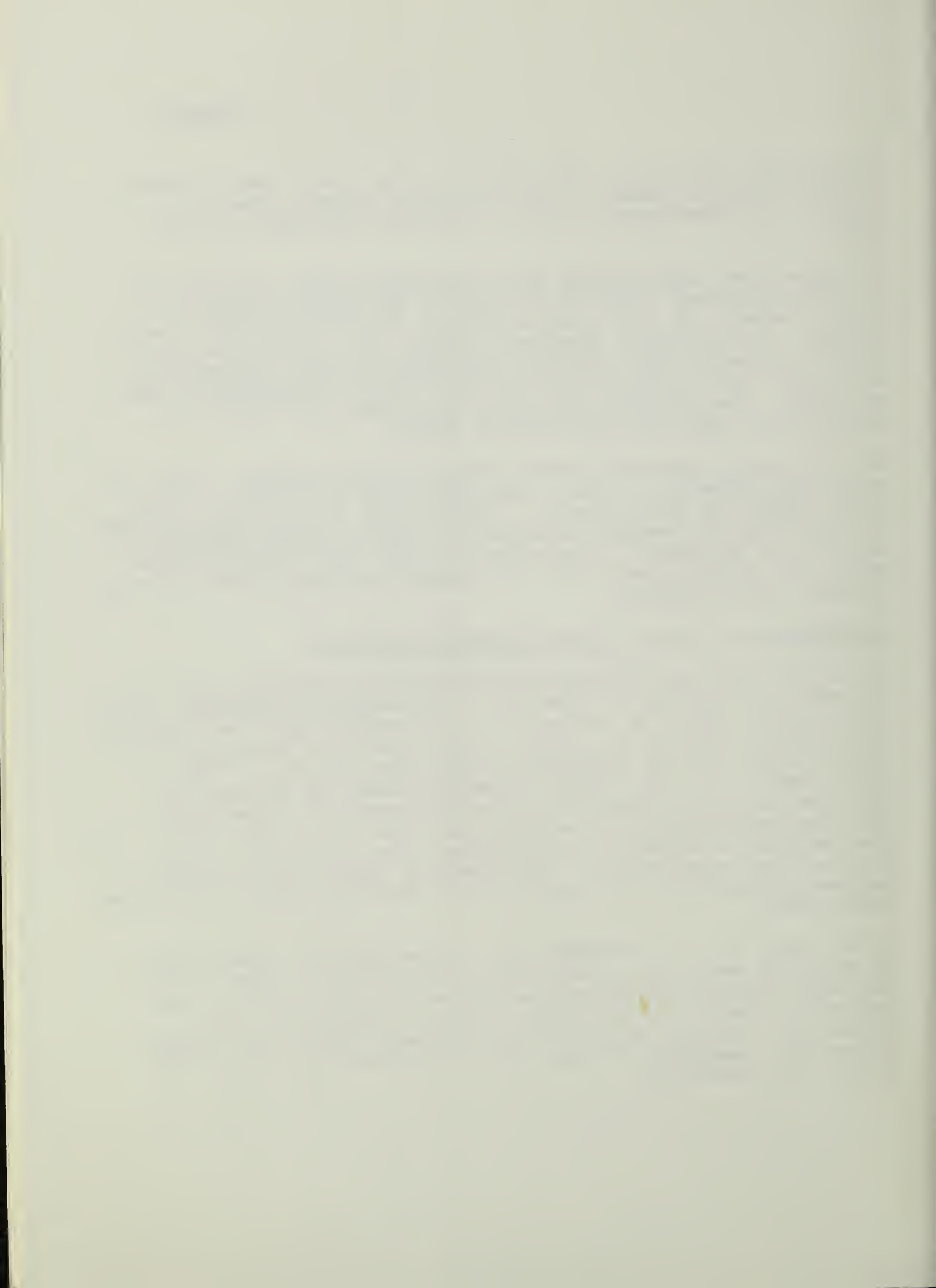
We agree that urbanization has suppressed animal populations in the watershed. Only 19 percent of Montgomery County is still wooded, and less than 5 percent of the watershed remains wooded. The existing abandoned fields and wooded areas can help to prevent sheet erosion and reduce stream sedimentation while providing attractive areas for birds, mammals and other wildlife. The wooded areas would have maximum benefit to wildlife if left in their natural state.

The following statement needs further clarification: "Lack of water impoundments is also responsible for the lack of waterfowl, marsh and shore birds." These birds also require habitat for nesting and feeding in order to sustain viable populations within the watershed. Impoundments alone may provide little more than resting areas for a few water-dependent birds passing through the watershed.

Environmental Impact - Land Treatment Measures

It is not clear how effective the structural measures will be in reducing sediment in Pine Run. The existing turbidity level is 780 ppm. With the project, it is expected that the sediment load will be reduced by 1,250 tons per year and that the turbidity level will be decreased to 680 ppm per year. This would imply that only larger materials would be settled out and fine-grained sediment would still remain in suspension. The fine materials and associated turbidities are the ones that suffocate aquatic invertebrates, clog fish gills, and reduce plant productivity. We question whether the proposed sediment reduction will significantly benefit fishery resources downstream.

There seems to be a contradiction concerning the enhancement of wildlife resources. Both the environmental statement and the work plan emphasize how beneficial any vegetation in an urbanized area is to wildlife; however, the project will permanently destroy 35 acres and adversely affect 115 acres of the few remaining natural woods and abandoned fields left within the watershed.



Structural Measures

The creation of a good warm-water fishery from either impoundment is questionable. The ponds will have long turnover rates during the summer and fall when discharges drop below 3 cfs. The ponds will be enriched by runoff from the urbanized area; initial water quality data indicate high phosphates and potentially high nitrates. Summer blooms of algae and nuisance plants are possible in shallow ponds under these conditions.

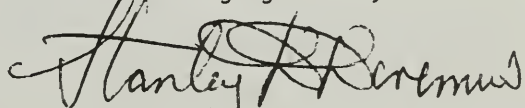
The grubbing and clearing of vegetation in waters less than 2 feet deep will severely limit the value of the impoundment to water-dependent birds. The shoreline should be planted with emergent and/or submergent vegetation to provide a food source to waterfowl and marsh and shore birds.

Alternatives

None of the alternatives examined the possibility of using check dams, weirs, etc., to help control stream sedimentation. Channelized areas could be stabilized to prevent further stream bank erosion, and sheet erosion could be controlled through land treatment and non-structural measures. There was no consideration given to the use of levees or dikes to help contain flood waters. The use of levees would have the added benefit of avoiding construction of one or both flood retarding structures and the subsequent loss of 35 acres of natural woods and abandoned fields. These areas could then be preserved in their natural state for the enjoyment of all.

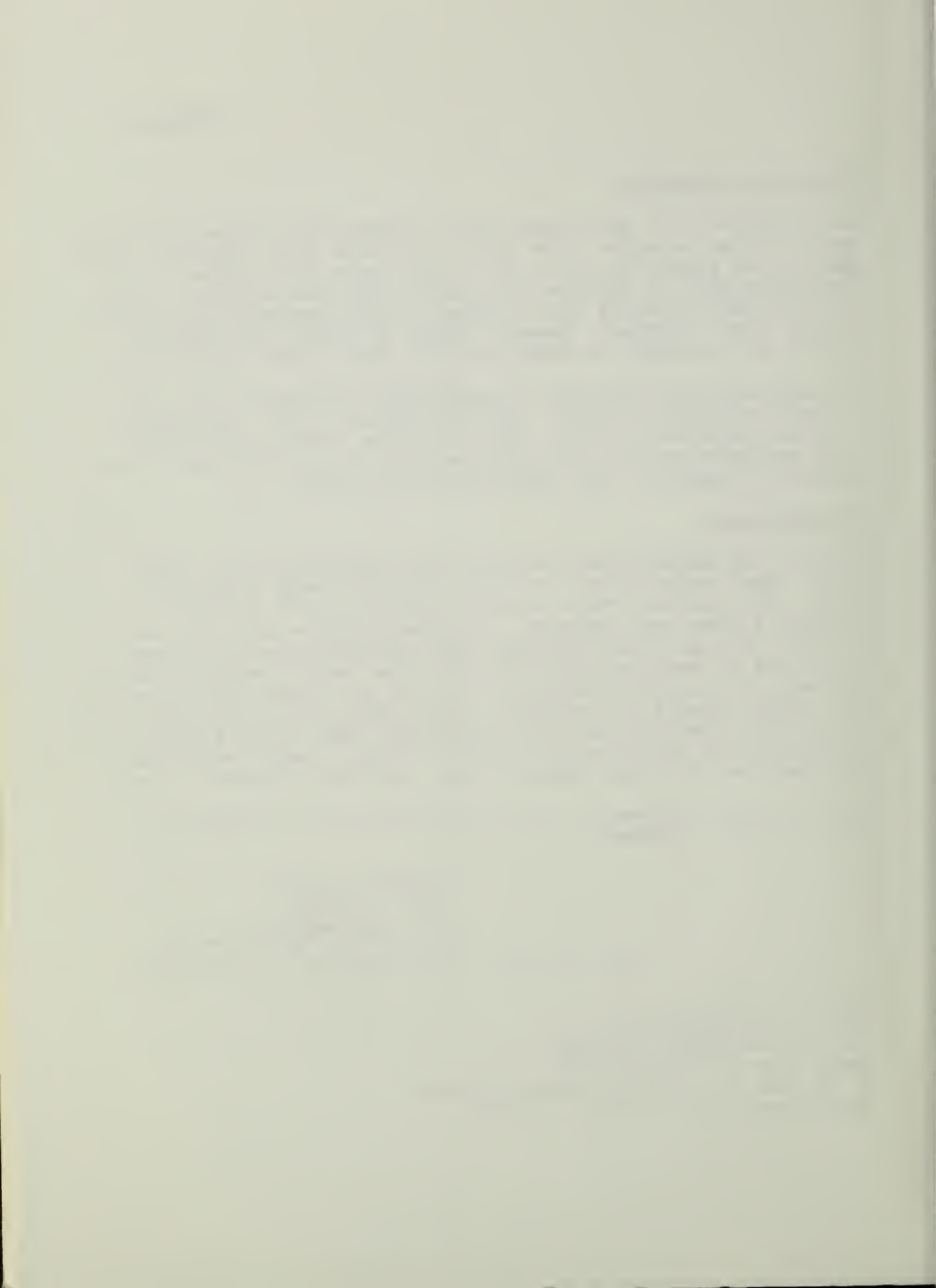
We hope these comments will be of assistance in preparing final project documents.

Sincerely yours,



Deputy Assistant Secretary of the Interior

Mr. Benny Martin
State Conservationist
Soil Conservation Service
Department of Agriculture
P. O. Box 985, Federal Square Station
Harrisburg, Pennsylvania 17108





APPENDIX C
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III

6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106
February 21, 1975

Mr. Benny Martin
State Conservationist
Soil Conservation Service
Box 985, Federal Square Station
Harrisburg, Pennsylvania 17108

Dear Mr. Martin:

We received the official draft environmental impact statement for the Pine Run Watershed, Montgomery County, Pennsylvania on February 19, 1975. We have reviewed the document and found it very similar to a report we received last December. We had assumed at that time that that was the official statement as it was not marked "preliminary". We want you to consider our comments of January 22, 1975 on this preliminary statement as our official report on this proposal.

Mr. Frank Thoumsin of this office discussed this matter by telephone with Mr. Clint Johnson of your office on February 20, 1975.

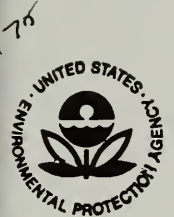
Sincerely yours,

Nicholas M. Ruha
Chief
EIS and Wetlands Review Section

Enclosure

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APPENDIX C
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

January 22, 1975

Mr. Benny Martin
State Conservationist
Soil Conservation Service
Box 985, Federal Square Station
Harrisburg, Pennsylvania 17108

Dear Mr. Martin:

We have completed our review of the draft environmental impact statement concerning the Pine Run Watershed, Montgomery County, Pennsylvania.

We have no objections to the proposal, as presented in this document. We have placed the project in EPA Reporting Category LO-1. This means that in addition to the lack of objections concerning the plan we believe the statement adequately describes the work to be performed.

The classification and the date of EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our reviews on proposed actions under Section 309 of the Clean Air Act.

Sincerely yours,

Nicholas M. Ruha
Chief
EIS and Wetlands Review Section

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THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
JANUARY 1950

TO THE HONORABLE CHAIRMAN OF THE BOARD OF TRUSTEES
OF THE UNIVERSITY OF CHICAGO
FROM THE DEPARTMENT OF CHEMISTRY
SUBJECT: REPORT ON THE PROGRESS OF THE RESEARCH
DURING THE YEAR 1949

The following is a summary of the work done in the Department of Chemistry during the year 1949. The work was carried out under the direction of the Department Chairman, Professor [Name], and the assistance of the following faculty members: [List of names]. The work was supported by the following grants: [List of grants].



COMMONWEALTH OF PENNSYLVANIA
GOVERNOR'S OFFICE
OFFICE OF THE BUDGET
HARRISBURG, PA. 17120
P.O. Box 1323

ENVIRONMENTAL IMPACT REVIEW
PENNSYLVANIA STATE CLEARINGHOUSE
Phone: 717-787-8046

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Kirkaldie
April 22, 1975
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Title: DEIS - Pine Run Watershed Project

Mr. Benny Martin, State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
Box 985 Federal Square Station
Harrisburg, Pa. 17108

Location: Montgomery County

Applicant: U.S. Dept. of Agriculture

PSCH project number: 75 01 3 001

Dear Mr. Martin:

The Governor's Budget Office, as the State Clearinghouse for the Commonwealth of Pennsylvania, has received and transmitted to various State agencies, including the Department of Environmental Resources, copies of the environmental statement mentioned above.

Attached to this letter please find the comments of the Department of Environmental Resources and the following State agencies:

Pennsylvania Fish Commission.

Please consider these the official response of the Commonwealth in this matter.

Sincerely,

Richard A. Heiss
Richard A. Heiss, Coordinator
Pennsylvania State Clearinghouse



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COMMONWEALTH of PENNSYLVANIA



DEPARTMENT OF ENVIRONMENTAL RESOURCES

P. O. BOX 1467

HARRISBURG, PENNSYLVANIA 17120

April 8, 1975

SUBJECT: Department of Environmental Resources
Review and Evaluation of
PSCH No.: 75-01-3-001

TITLE: DEIS - Pine Run Watershed Project

LOCATION: Montgomery County

TO: R. A. Heiss, Coordinator
Pennsylvania State Clearinghouse

A handwritten signature in cursive script, reading "Maurice K. Goddard".

FROM: MAURICE K. GODDARD
Secretary of Environmental Resources

No significant or adverse impact is anticipated by the implementation of this project. However, the Department of Environmental Resources offers these comments.

This project has been evaluated on the basis of the actions proposed in the applicant's submission. Any approval, granted or implied, does not extend to any changes made by the applicant subsequent to and not in keeping with our recommendations. Any such changes will require a new submission through the Pennsylvania State Clearinghouse.

The proposed project mainly concerns the installation of Pa. 634 and pa. 635 impoundments, development of a park area, and protecting fragile and natural ecosystems in Upper Dublin Township, Montgomery County. The proposed project is located northeast of the Fort Washington Pennsylvania Turnpike interchange.

Pa. 634 impoundment is a multi-purpose fish, wildlife, and flood prevention structure. Pa. 635 impoundment is a flood prevention structure. Pa. 634 and Pa. 635 impoundments will control drainage from 3,400 acres. These proposed structures will protect the Fort Washington Industrial Park area near Route 309 and the Fort Washington Pennsylvania Turnpike intersection from floods.

Malfunctioning septic tanks will be eliminated by the installation of public sewerage facilities. Land treatment, which includes land beautification, planting of trees and shrubbery is included in the project. The discharge of sediment into waterways will be reduced. The project is expected to protect fish and wildlife by improving their habitats. The proposed project will improve the quality of the environment.

We have no studies, active or pending, in the Pine Run or Sandy Run Watersheds. Our "Sandy Run Drainage Basin Study" was completed in November 1970. In this study a local flood protection project in the vicinity of the Sheridan Inn just downstream from the SCS project area was given consideration. However, a project could not be economically justified. The problem was reevaluated in March 1973 with the same results.

The proposed SCS project on Pine Run will provide considerable flood relief at this location. Flood stages along Sandy Run in the Fort Washington Industrial Park area will be reduced by 3.2 feet for the 100 year flood. The peak discharge of Pine Run at its confluence with Sandy Run for the 100 year flood will be reduced from 4,350 cfs to 2300 cfs. Flood damages along Sandy Run downstream from the project area are expected to be reduced by 57 percent.

The report makes no mention of Commonwealth participation in the providing of funds for the sponsor's costs (Montgomery County).

In the Office of State Planning and Development, Region 1, which is comprised of Chester, Delaware, Philadelphia, Bucks, and Montgomery Counties, there is no State forest land in any of these counties and there are over 26,000 acres of park lands.

Information presented on recreation resources is extremely out-dated. Five new State parks have been opened by this region since the 1969 data was released.

New State wide recreation plan will provide more updated data.

The first part of the study focuses on the theoretical framework and the research objectives. It discusses the importance of understanding the relationship between the variables under investigation and the need for a systematic approach to data collection and analysis.

The methodology section describes the research design, including the selection of the sample, the data collection methods, and the statistical techniques used for data analysis. It also outlines the ethical considerations and the steps taken to ensure the integrity of the research.

The results section presents the findings of the study, organized into several sub-sections. Each sub-section discusses a specific aspect of the data, providing a detailed analysis of the results and their implications for the research objectives.

The discussion section provides a comprehensive overview of the findings, highlighting the key results and their significance. It also discusses the limitations of the study and suggests areas for future research.

The conclusion section summarizes the main findings of the study and provides a final statement on the research objectives. It also discusses the practical implications of the results and the overall contribution of the study to the field.

The final part of the study is the bibliography, which lists all the sources used in the research. It includes books, journal articles, and other relevant literature.

The appendix section contains additional information that supports the main findings of the study. It includes raw data, detailed calculations, and other supplementary materials.

The final page of the study is the index, which provides a quick reference to the various sections and topics discussed in the document.

The impact statement should include a map delineating the different land use categories resulting from the project such as urban, temporary flood pool, permanent pool, locations of land treatment measures, proposed open land, access points, etc.

The impact statement should discuss the affects on the base flows of the streams which would result when all urbanized areas are placed on public sewers.

The proposed project should have no adverse affects on the ground water in this area.

Geologic conditions have been described adequately and should have no adverse effects on the project.

The noise levels could become a nuisance to nearby residences, and therefore should be minimized.

The proposed project must be done in compliance with the Department of Environmental Resources rules and regulations regarding fugitive dust emissions and erosion control.

The Department of Environmental Resources retains an interest in this project and desires to be informed of any adverse environmental effects encountered or anticipated in the further development of this project.

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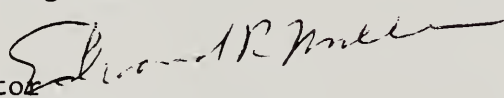
ER

March 13, 1975

SUBJECT: Pine Run Watershed Draft Environmental
Impact Statement and Work Plan Agreement

75-01-3-001

TO: Richard Heiss, State Coordinator
Pennsylvania State Clearinghouse

FROM: Edward R. Miller, Director 
Bureau of Fisheries and Engineering
Pennsylvania Fish Commission

The subject material has been reviewed by the Pennsylvania Fish Commission, and we have no objections to the general program as planned.

Neither Rapp Run nor Pine Run support a fishery in the area involved and, therefore, the dams will not have other than a temporary siltation effect. They should decrease siltation below the dams as much silt will settle out in the impoundments. Also, proposed upstream land improvements should lessen siltation.

There seems to be some discrepancy as to the size of the pool of PA 634. Will it have a 9 acre sediment pool or a 28 acre recreational pool? There also is some chance now that these may be dry dams.

This is an extremely urbanized and industrialized area, and these may soon represent the major open spaces.

The statement is made that where 145 acres are now flooded by a 100 year flood along Pine and Rapp Runs only 50 will be flooded after the project. Also, another 50 acres will be protected on Sandy Run. This sounds like they are protecting land so it can be developed. Flood control must be to protect developed land and never to protect land for development. This can lead to even greater damage if a flood of greater magnitude occurs.

ERM/JGM:dms

161
COMMONWEALTH OF PENNSYLVANIA

APPENDIX C



DEPARTMENT OF ENVIRONMENTAL RESOURCES

P. O. BOX 1467

HARRISBURG, PENNSYLVANIA 17120
STATE CONSERVATION COMMISSION
April 14, 1975

Mr. Benny Martin, State Conservationist
USDA, Soil Conservation Service
Box 985, Federal Square Station
Harrisburg, Pennsylvania 17108

Dear Benny:

We have reviewed the Work Plan and draft Environmental statement for the Pine Run Watershed Project, Montgomery County, Pennsylvania. The Soil Conservation Service should be congratulated for preparing a comprehensive program to abate flood damage in a difficult watershed area.

The system of impoundment and nonstructural techniques should provide maximum benefits to local people. Since urbanization is taking place at a rapid rate, the erosion and sediment control preventative measures are an important part of the plan. We strongly support this project feature.



All significant environmental consequences have been addressed in the draft Environmental Impact Statement and we have no specific comments to make at this time.

Sincerely yours,

A handwritten signature in cursive script, reading "Walter N. Peechatka".

Walter N. Peechatka
Director

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APPENDIX C

COMMONWEALTH OF PENNSYLVANIA



PENNSYLVANIA TURNPIKE COMMISSION

P.O. BOX 2531 - HARRISBURG, PA. 17120

OFFICE
OF
CHIEF ENGINEER

AREA CODE 717 939-9551

April 11, 1975

United States Department
of Agriculture
Soil Conservation Service
Post Office Box 985
Federal Square Station
Harrisburg, Pennsylvania 17108

Attention: Mr. Benny Martin
State Conservationist

Re: Pine Run Watershed
Wissahickon Creek
Montgomery County
Milepost 340.5 WB

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Dear Mr. Martin:

We have reviewed the February 1975 "Draft Watershed Work Plan" and "Draft Environmental Impact Statement" for the subject project which you forwarded with your February 14, 1975 letter.

It appears that all Commission criteria dating back to 1963 has been incorporated in the documents. Our last reply on this matter was by letter March 17, 1971. A copy is attached. We repeat our request to review the construction plans when the project is authorized and advances to the final design stage. We expect our comments will be confined to items adjacent or within our right-of-way such as flowage easements, stone slope protection, and the location of the permanent security fencing.

APPENDIX C

United States Department
of Agriculture
April 11, 1975

re: Pine Run Watershed
Wissahickon Creek
Montgomery County
Milepost 340.5 WB

We, therefore, have no objections to the contents of
either document submitted under date of February 14, 1975.

Very truly yours,



Robert H. Klucher, P.E.
Chief Engineer

Attachment

APPENDIX C

March 17, 1971

United States Department
of Agriculture
Soil Conservation Service
Post Office Box 888
Federal Square Station
Harrisburg, Pennsylvania 17108

Attention: Mr. William C. Facke, III
Work Plan Staff Leader

Re: Wissahickon Creek Watershed
Flood Control Project
P.A.-835 - Montgomery County
M.P. 340.5

Gentlemen:

Reference is made to your January 6, 1971, transmittal on this subject, and to Mr. Barber's informal telephone comments to your Mr. Lloyd Thomas on March 2, 1971.

Our Consultant and staff have reviewed the revised preliminary design shown on the sketch transmitted January 6, 1971. The design conforms to our November 12, 1970, meeting requests, and all spillway construction has been removed from our present right-of-way as well as from our anticipated ultimate 80-foot right-of-way widening to provide for a future Turnpike construction.

The flowage easement requirements along our existing embankment remain essentially the same as those detailed in 1963 transmittals. Our replies of December 4, 1963, and December 17, 1963, remain applicable to these details. Our specific comments on proposed stone slope protection and related details are reserved for future review and comment, when the project is authorized and advances to

APPENDIX C

United States Department
of Agriculture
Page -2-
March 17, 1971

Re: Wissahickon Creek Watershed
Flood Control Project
P.A.-635 - Montgomery County
M.P. 340.5

the final design stage.

We, therefore, approve the January 6, 1971, transmittal for your present purpose, i.e. your application for Federal approval of this preliminary phase of your project.

Very truly yours,

ROBERT H. KLUCHER
CHIEF ENGINEER

HAB/ldt

cc: The Honorable L. F. Burlein
Mr. F. V. Summers
Mr. J. R. Rezzolla, Jr.
Mr. C. W. Branthoffer
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APPENDIX C

MONTGOMERY COUNTY PLANNING COMMISSION
court house ■ norristown, pennsylvania 19404 ■ 215-275-5000

April 25, 1975

Mr. Benny Martin, State Conservationist
U. S. Department of Agriculture
Box 985 Federal Square Station
Harrisburg, Pa. 17108

Dear Mr. Martin:

We have reviewed the Watershed Work Plan and Draft Environmental Impact Statement for the Pine Run Project per your request of February 14, 1975.

In our letter of January 14, 1975 we endorsed the plan contingent upon an updating of the cost-benefit ratio. The February draft contains updated figures for land acquisition costs which we feel are much more representative of current market conditions.

Since our last correspondence, we have become aware of a wastewater facilities study currently being conducted in the watershed. Coordination between the two programs is essential to insure that conflicting planning goals are not being pursued. We also note that the section on Nonstructural Measures has been modified to more accurately reflect the role of the township in land use planning and regulation.

In view of these changes to the Work Plan please accept our endorsement of the project.

Sincerely,

Arthur F. Loeben
Director

cc: Marvin S. Feller, Upper Dublin Township Manager
Maynard King, Montco Conservation District
Jerry Gray, DVRPC

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AFL/mmr

12/15



Northwest Pennsylvania Chapter
2736 West 33rd Street
Erie, Pennsylvania 16506

APPENDIX C

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- ASC (WS-RC&D) ✓
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Kirk/Boyle FK

March 10, 1975

Mr. Benny Martin
State Conservationist
Soil Conservation Service
Harrisburg, Pennsylvania

Dear Mr. Martin:

Subject: Draft EIS, Pine Creek Watershed

Thank you for sending Draft EIS above captioned. Ken Sink received a copy a couple of weeks ago and has also forwarded that copy on to me.

The Draft EIS was reviewed by the State Council of Trout Unlimited this past weekend and since construction measures will not affect or degrade any existing trout water in the Pine Creek area we wish to make no adverse comment.

However, please continue to favor either Dave Dennington or myself with Draft Environmental Impact Statements on all current and future PL 566 projects since a Negative Declaration will not meet NEPA requirements.

Very truly yours,

John F. Busch, Jr.
Legal and Advisory
Committee

Copy: Ken Sink
Dave Dennington
Mike Boyle

